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Data Compilation for AGR-2 UCO Variant Compact Lot LEU09-OP2-Z

Revision 1

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Data Compilation for AGR-2 UCO Variant Compact Lot LEU09-OP2-Z

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This document is a compilation of characterization data for the candidate AGR-2 UCO Variant fuel compact lot LEU09-OP2-Z. The compacts were produced by ORNL for the Advanced Gas Reactor Fuel Development and Qualification (AGR) program for the second AGR irradiation test (AGR-2). This compact lot was fabricated using particle composite LEU09. LEU09 came from Babcock and Wilcox (B&W) coated particle lot G73J-14-93073A, which was an upgraded batch of TRISO-coated 425 μm diameter, 14% low enriched uranium oxide/uranium carbide kernels (LEUCO). The AGR-2 TRISO-coated particles consist of a spherical kernel coated with an ~50% dense carbon buffer layer (100 μm nominal thickness), followed by a dense inner pyrocarbon layer (40 μm nominal thickness), followed by a SiC layer (35 μm nominal thickness), followed by another dense outer pyrocarbon layer (40 μm nominal thickness). The kernels were also manufactured by B&W and identified as kernel lot G73I-14-69307. Two data packages were submitted by B&W containing the acceptance testing results for the kernels and coated particles, these are identified by their lot numbers. A discussion on the coating of the B&W TRISO particles can also be found in INL report INL/EXT-09-16545. A data compilation of ORNL analysis of G73J-14-93073A can be found in ORNL/TM-2008/134.

The AGR-2 Fuel Specification (INL SPC-923) provides the requirements necessary for acceptance of the fuel manufactured for the AGR-2 irradiation test. Section 3.3 of SPC-923 provides the property requirements for the heat treated compacts. The Statistical Sampling Plan for AGR-2 Fuel Materials (INL PLN-2691) provides additional guidance regarding statistical methods for product acceptance and recommended sample sizes. The procedures for characterizing and qualifying the compacts are outlined in ORNL product inspection plan AGR-CHAR-PIP-12. The inspection report forms generated by this product inspection plan document the product acceptance for the property requirements listed in section 3.3 of SPC-923. Prior to compacting, the overcoated particles are characterized per ORNL product inspection plan AGR-CHAR-PIP-11 to obtain data needed for calculation of compacting charge weight and matrix density. Riffling of compact charges is also covered by this procedure. Prior to overcoating, the TRISO particles are characterized per ORNL product inspection plan AGR-CHAR-PIP-10 to determine uranium content, obtain data needed for overcoating and compact fabrication, and obtain further data needed for calculation of matrix density. Riffling of overcoater charges is also covered by this procedure. This document contains all the inspection report forms and data report forms generated by these inspection plans.

In addition to the characterization data, this report also contains other records relevant to the fuel product acceptance. A history of the material flow and sample naming is included. The overcoating and compacting process is summarized, and a record of the materials used to make the matrix is included. A Certificate of Conformance and any applicable Nonconformance Reports are attached as Appendices.

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1 Material identification record for LEU09-OP2-Z compacts

Table 1-1 lists the materials used to make the LEU09-OP2-Z compacts, including intermediate batches and samples used for characterization. TRISO-coated particles were shipped from B&W to ORNL on April 23, 2009. Forty eight completed compacts were shipped to INL on October 28, 2009. Twelve compacts were retained at ORNL and 107 compacts were consumed at ORNL by the QC acceptance testing. Table 1-2 lists the disposition of each compact.

Table 1-1: Material identification record for LEU09-OP2-Z compacts

Sample ID	Parent material	Notes
G73I-14-69307	G73I-14-59370 G73I-14-59371 G73I-14-59372 G73I-14-59373 G73I-14-59375	B&W kernel composite from 5 batches
G73J-14-93073A	G73I-14-69307	B&W TRISO-coated particles
NP-B8453 NP-B8454 NP-B8455 NP-B8456	G73J-14-93073A	999.9 g sample from 93073A shipped to ORNL on 4/23/2009
LEU09	NP-B8453 NP-B8454 NP-B8455 NP-B8456	TRISO-coated particles re-composited, washed with methanol, and sorted by roller-micrometer to remove 0.0127 g of the smallest (faceted) particles
LEU09-A01	LEU09	TRISO-coated particle QC archive
LEU09-B01 LEU09-C01 LEU09-D01 LEU09-E01 LEU09-F01 LEU09-G01	LEU09	TRISO-coated particle characterization samples
LEU09-Y##	LEU09	Charges for overcoating, numbered Y01 through Y48 LEU09-Y42 to LEU09-Y48 were not overcoated
RD13371	Asbury Graphite Mills	Natural graphite
KRB2000	SGL Carbon	Synthetic graphite
SC1008	Hexion	Durite resin lot LK9DA0008
RDKrS-050809 RDKrS-052109 RDKrS-060109	64 wt% RD13371 16 wt% KRB2000 20 wt% SC1008	Matrix precursor batches
LEU09-OP2	LEU09-Y01 to LEU09-Y17 + RDKrS-050809 LEU09-Y18 to LEU09-Y34 + RDKrS-052109 LEU09-Y35 to LEU09-Y41 + RDKrS-060109	Over-coated particle composite.
LEU09-OP2-A01	LEU09-OP2	Overcoated particle QC archive
LEU09-OP2-B01 LEU09-OP2-C01	LEU09-OP2	Overcoated particle characterization samples
LEU09-OP2-G###	LEU09-OP2	Compacts, numbered G001 through G185
LEU09-OP2-Z###	LEU09-OP2-G###	Compacts, numbered Z001 through Z167 One to one correspondence to G### recorded on DRF24C (section 7)

Table 1-2: Disposition of LEU09-OP2-Z compacts

Sent to INL	Retained at ORNL	Consumed during QC analysis		
LEU09-OP2-Z014	LEU09-OP2-Z002	LEU09-OP2-Z001	LEU09-OP2-Z072	LEU09-OP2-Z151
LEU09-OP2-Z015	LEU09-OP2-Z004	LEU09-OP2-Z003	LEU09-OP2-Z073	LEU09-OP2-Z152
LEU09-OP2-Z016	LEU09-OP2-Z005	LEU09-OP2-Z006	LEU09-OP2-Z074	LEU09-OP2-Z155
LEU09-OP2-Z017	LEU09-OP2-Z038	LEU09-OP2-Z007	LEU09-OP2-Z076	LEU09-OP2-Z157
LEU09-OP2-Z018	LEU09-OP2-Z057	LEU09-OP2-Z008	LEU09-OP2-Z078	LEU09-OP2-Z159
LEU09-OP2-Z022	LEU09-OP2-Z069	LEU09-OP2-Z009	LEU09-OP2-Z080	LEU09-OP2-Z160
LEU09-OP2-Z026	LEU09-OP2-Z089	LEU09-OP2-Z010	LEU09-OP2-Z081	LEU09-OP2-Z161
LEU09-OP2-Z028	LEU09-OP2-Z102	LEU09-OP2-Z011	LEU09-OP2-Z084	LEU09-OP2-Z162
LEU09-OP2-Z040	LEU09-OP2-Z130	LEU09-OP2-Z012	LEU09-OP2-Z086	LEU09-OP2-Z163
LEU09-OP2-Z043	LEU09-OP2-Z139	LEU09-OP2-Z013	LEU09-OP2-Z087	LEU09-OP2-Z164
LEU09-OP2-Z049	LEU09-OP2-Z158	LEU09-OP2-Z019	LEU09-OP2-Z090	LEU09-OP2-Z166
LEU09-OP2-Z053	LEU09-OP2-Z165	LEU09-OP2-Z020	LEU09-OP2-Z091	
LEU09-OP2-Z056		LEU09-OP2-Z021	LEU09-OP2-Z093	
LEU09-OP2-Z059		LEU09-OP2-Z023	LEU09-OP2-Z094	
LEU09-OP2-Z062		LEU09-OP2-Z024	LEU09-OP2-Z095	
LEU09-OP2-Z063		LEU09-OP2-Z025	LEU09-OP2-Z096	
LEU09-OP2-Z066		LEU09-OP2-Z027	LEU09-OP2-Z097	
LEU09-OP2-Z075		LEU09-OP2-Z029	LEU09-OP2-Z098	
LEU09-OP2-Z077		LEU09-OP2-Z030	LEU09-OP2-Z099	
LEU09-OP2-Z079		LEU09-OP2-Z031	LEU09-OP2-Z101	
LEU09-OP2-Z082		LEU09-OP2-Z032	LEU09-OP2-Z106	
LEU09-OP2-Z083		LEU09-OP2-Z033	LEU09-OP2-Z107	
LEU09-OP2-Z085		LEU09-OP2-Z034	LEU09-OP2-Z108	
LEU09-OP2-Z088		LEU09-OP2-Z035	LEU09-OP2-Z109	
LEU09-OP2-Z092		LEU09-OP2-Z036	LEU09-OP2-Z110	
LEU09-OP2-Z100		LEU09-OP2-Z037	LEU09-OP2-Z111	
LEU09-OP2-Z103		LEU09-OP2-Z039	LEU09-OP2-Z113	
LEU09-OP2-Z104		LEU09-OP2-Z041	LEU09-OP2-Z115	
LEU09-OP2-Z105		LEU09-OP2-Z042	LEU09-OP2-Z116	
LEU09-OP2-Z112		LEU09-OP2-Z044	LEU09-OP2-Z117	
LEU09-OP2-Z114		LEU09-OP2-Z045	LEU09-OP2-Z118	
LEU09-OP2-Z119		LEU09-OP2-Z046	LEU09-OP2-Z120	
LEU09-OP2-Z124		LEU09-OP2-Z047	LEU09-OP2-Z121	
LEU09-OP2-Z125		LEU09-OP2-Z048	LEU09-OP2-Z122	
LEU09-OP2-Z126		LEU09-OP2-Z050	LEU09-OP2-Z123	
LEU09-OP2-Z127		LEU09-OP2-Z051	LEU09-OP2-Z133	
LEU09-OP2-Z128		LEU09-OP2-Z052	LEU09-OP2-Z136	
LEU09-OP2-Z129		LEU09-OP2-Z054	LEU09-OP2-Z137	
LEU09-OP2-Z131		LEU09-OP2-Z055	LEU09-OP2-Z138	
LEU09-OP2-Z132		LEU09-OP2-Z058	LEU09-OP2-Z140	
LEU09-OP2-Z134		LEU09-OP2-Z060	LEU09-OP2-Z143	
LEU09-OP2-Z135		LEU09-OP2-Z061	LEU09-OP2-Z144	
LEU09-OP2-Z141		LEU09-OP2-Z064	LEU09-OP2-Z145	
LEU09-OP2-Z142		LEU09-OP2-Z065	LEU09-OP2-Z146	
LEU09-OP2-Z153		LEU09-OP2-Z067	LEU09-OP2-Z147	
LEU09-OP2-Z154		LEU09-OP2-Z068	LEU09-OP2-Z148	
LEU09-OP2-Z156		LEU09-OP2-Z070	LEU09-OP2-Z149	
LEU09-OP2-Z167		LEU09-OP2-Z071	LEU09-OP2-Z150	

2 Summary of acceptance test results for LEU09-OP2-Z

At the end of this section is the inspection report form IRF-12A associated with the compact lot LEU09-OP2-Z. This inspection report form also appears in section 7 of this compilation, accompanied by the associated data report forms (DRFs) showing the results of each individual measurement. The inspection report form summarizes the acceptance testing performed according to the product inspection plan AGR-CHAR-PIP-12. The information in this form covers all the property specifications listed in section 3.3 of the AGR-2 Fuel Specification (INL SPC-923, Rev. 3). The compact lot, LEU09-OP2-Z, did not meet all the requirements in section 3.3 of SPC-923, Rev. 3. A nonconformance related to a higher than allowed fraction of exposed uranium was determined by the program to be acceptable for the AGR-2 irradiation test. The exposed uranium was due to cracked TRISO layers in the coated particle composite. These cracks are thought to have occurred at B&W when particles were removed from the coating furnace using a suction device. The final disposition of this compact lot was to "use as is" for the AGR-2 irradiation test. This disposition was documented on INL NCR-44791.

Table 2-1 is provided for quick reference. It gives the mean values of key variable properties of the compact lot, LEU09-OP2-Z. For standard deviations of the distribution of the measured values see the appropriate IRF or DRF. For discussions on the uncertainty in these values, see the associated data acquisition methods and data report forms.

Table 2-1: Quick reference table for key variable properties of LEU09-OP2-Z.

Property	Mean
Mean uranium loading (g U/compact)	1.251
Compact diameter (mm)	12.29
Compact length (mm)	25.14
Compact mass (g)	6.295
Compact matrix density (g/cm^3)	1.59
Impurity content	Table 2-2

The reported mean impurity levels for the fuel compacts, recorded on IRF-12A and IRF-12B, may be higher than the actual values. This is because the as-reported mean impurity levels do not reflect the fact that some of the measurements were at or below the mass spectrometry measurement threshold, and thus could not be differentiated from zero. For the purpose of the acceptance test, impurity values reported as threshold values (documented in the data report forms with the < symbol) are always assumed to be equal to the maximum possible value. In addition, each time a leach was performed, a blank run was also performed, where all the relevant wet chemistry steps in the leach-burn-leach procedure in AGR-CHAR-DAM-26R1 were performed without a compact present, in order to obtain background values for each analyzed impurity. If a measurable impurity value was obtained in the blank, then that value was subtracted from the measured value in each sample. However, if a threshold value was reported in the blank, then no background subtraction was performed. Table 2-2 shows the possible range for the measured impurities, where the upper limit is the as-reported mean and the lower limit is the possible minimum value calculated by accounting for the fact that values reported as

threshold values could have been as low as zero. This range reflects the uncertainty in the measured impurity values due to the mass spectrometry measurement thresholds.

Table 2-2: Mean impurity levels for fuel compacts from LEU09-OP2-Z compact lot measured by deconsolidation leach-burn-leach technique.

Impurity	Measured impurity content (μg/compact)
Iron	0.51 - 4.04
Chromium	0.46 - 0.61
Manganese	0.000 - 0.136
Cobalt	0.000 - 1.115
Nickel	0.38 - 0.96
Calcium	36.20 - 39.34
Aluminum	29.60 - 29.60
Titanium	2.20 - 2.81
Vanadium	16.94 - 17.09

Table 2-3 is also provided for quick reference. It gives the binomial distribution calculated upper limit of the 95% confidence interval of the defect fraction for key attribute properties of the compact lot LEU09-OP2-Z. In other words, these values are the lowest tolerance limits for which the compact lot would be deemed acceptable at 95% confidence, based on the particular sample that was measured. Also listed in the table are the actual number of defects observed and the number of particles analyzed. Note that in the case of all but the uranium contamination fraction, zero defects were observed. The defect fractions listed in the table for these cases are limited by the number of particles measured and the actual defect fraction could be much lower.

Table 2-3: Quick reference table for key attribute properties of LEU09-OP2-Z.

Property	Observed Number of Defects/ Number of Particles Analyzed	95% Confidence Defect Fraction
Uranium contamination fraction	3/317625	≤2.5E-5
Defective SiC coating fraction	0/254100	≤1.2E-5
Defective IPyC coating fraction	0/63525	≤4.8E-5
Defective OPyC coating fraction	0/3176	≤9.5E-4

It is also interesting to note the increase in pyrocarbon anisotropy due to compact heat treatment. The diattenuation of the IPyC increased from 0.0116±0.0004 to 0.0155±0.0016 (1.0349±0.0012 to 1.0465±0.0049 in terms of effective BAFo). The diattenuation of the OPyC increased from 0.0088±0.0004 to 0.0143±0.0006 (1.0263±0.0011 to 1.0429±0.0019 in terms of effective BAFo).

Inspection Report Form IRF-12A: AGR-2 UCO Fuel Compact Lots

Procedure:	AGR-CHAR-PIP-12 Rev. 1
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Compact ID numbers of compacts available for irradiation test (pending acceptance):	002 004 005 014 015 016 017 018 022 026 028 038 040 043 049 053 056 057 059 062 063 066 069 075 077 079 082 083 085 088 089 092 100 102 103 104 105 112 114 119 124 125 126 127 128 129 130 131 132 134 135 139 141 142 153 154 156 158 165 167

Property	Measured Data: Mean (x)	Std. Dev. (s)	Measurements (n)	k or t value	Specification: INL SPC-923 Revison 3	Acceptance Criteria	Acceptance Test Value	Pass or fail	Data Records
Uranium loading (gU/compact)	1.257	0.003	6	2.015	1.265 ± 0.07	A = x - ts/√n ≥ 1.195	1.255	pass	DRF-25
						B = x + ts/√n ≤ 1.335	1.259	pass	
Compact diameter (mm)	See DRF-24				12.22 - 12.46	All available for irradiation test meet specification	See DRF-24	pass	DRF-24
Compact length (mm)					25.02 - 25.40				
Compact matrix density (g/cm^3)					≥1.45			pass	
Iron content outside SiC (µg/compact)	4.04	2.52	16	1.753	mean ≤ 25	B = x + ts/√n ≤ 25	5.1	pass	IRF-12B DRF-26
				3.463	dispersion ≤0.01 ≥ 100	D = x + √3ks < 100	19.2	pass	
Chromium content outside SiC (µg/compact)	0.61	0.12	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	0.7	pass	IRF-12B DRF-26
Manganese content outside SiC (µg/compact)	0.136	0.004	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	0.1	pass	IRF-12B DRF-26
Cobalt content outside SiC (µg/compact)	0.115	0.003	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	0.1	pass	IRF-12B DRF-26
Nickel content outside SiC (µg/compact)	0.96	0.20	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	1.0	pass	IRF-12B DRF-26
Cr + Mn + Co + Ni content outside SiC (µg/compact)	1.82	0.19	16	3.463	dispersion ≤0.01 ≥ 200	D = x + √3ks < 200	3.0	pass	IRF-12B DRF-26
Calcium content outside SiC (µg/compact)	39.34	12.65	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	44.9	pass	IRF-12B DRF-26
Aluminum content outside SiC (µg/compact)	29.60	3.44	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	31.1	pass	IRF-12B DRF-26
Ti + V content outside SiC (µg/compact)	19.91	2.47	16	1.753	mean ≤ 240	B = x + ts/√n ≤ 240	21.0	pass	IRF-12B DRF-26

Property	Measured Data: # of compacts	# of particles	Specification: INL SPC-923 Revison 2	Acceptance Criteria	Acceptance Test Value	Pass or fail	Data Records
Uranium contamination fraction (g exposed U/gram U in compact)	100	317625	≤ 2.0 x 10^{-5}	≤1 effectively exposed kernel in ≥237192 particles or ≤2 effectively exposed kernels in ≥314788 particles	3.1	fail	IRF-12C DRF-26
Defective SiC coating fraction (fraction of total particles)	80	254100	≤ 1.0 x 10^{-4}	≤2 leached kernels in ≥62956 particles or ≤6 leached kernels in ≥118422 particles	0	pass	IRF-12D DRF-26
Defective IPyC coating fraction (fraction of total particles)	20	63525	≤ 1.0 x 10^{-4}	≤1 with excessive U dispersion in ≥47437 particles or ≤2 with excessive U dispersion in ≥62956 particles	0	pass	DRF-28
Defective OPyC coating fraction (fraction of total particles)	1	3176	≤ 0.01	≤6 cracked or missing OPyC in ≥1182 particles	0	pass	DRF-27

Comments

A 3/317625 uranium contamination fraction is above the specified limit and corresponds to <2.5e-5 at 95% confidence. This non-conformance was documented on INL NCR-44791 with a disposition of use as is.

John Hunn — QC Supervisor

2-11-2010 — Date

Accept compact lot (Yes or No):	**Yes**

M. C. Richardson — QA Reviewer

2/11/10 — Date

3 Compacting process conditions

Four samples totaling 999.9 g were riffled from coated particle batch G73J-14-93073A using a chute splitter, and shipped from B&W on April 23, 2009. After receipt, the particles were sorted by size using a roller-micrometer (see Appendix C). No uncoated kernels or coating fragments were found. The first populated bin, corresponding to a roller gap of 750-775 μm and containing the smallest particles, had 14 particles in it. These particles, which were abnormally faceted and non-spherical, were discarded. The remaining material was re-composited and labeled LEU09.

The LEU09 particles were washed in methanol per procedure AGR-TRISOWASH-SOP-1, "Standard Operating Procedure for TRISO Particle Washing." Washing of particles prior to overcoating was adapted in order to help reduce the amount of contamination on the particles that may have been acquired during processing or general handling. This procedure also reduces the amount of loose carbon dust on the surface of the particles. The washing procedure was adopted from General Atomics' particle washing procedures.

After washing, AGR-CHAR-PIP-10, Rev. 2, "Product Inspection Plan for AGR-2 Particles for Compacting - Preliminary Measurements" was completed. This plan calls for measurement of average particle weight, diameter, envelope volume, and uranium content. The plan also calls for riffling of 20 gram aliquots for use as overcoater charges. Riffling at ORNL was done using a 10 position rotary riffler. After riffling out the characterization samples, forty-eight overcoater charges were prepared and labeled LEU09-Y01 through LEU09-Y48. The results of the PIP-10 inspection are reported in section 5. Additional ORNL characterization performed on another sample taken from G73J-14-93073A is provided in ORNL/TM-2008/134, "Data Compilation for AGR-2 UCO Variant Coated Particle Batch G73J-14-93073A."

One ~20g aliquot was used per overcoating run. Overcoating was performed according to AGR-COMP-SOP-2, Rev. 1, "Standard Operating Procedure for Overcoating TRISO Particles." The LEU09-Y01 through Y41 riffled aliquots were overcoated with the following matrix batches: Y01-Y17 (RDKrS 050809), Y18-Y34 (RDKrS 052109), and Y35-Y41 (RDKrS 060109). The Y42 to Y48 overcoating charges were not used because a sufficient quantity of correctly sized overcoated particles was accumulated with charges Y01-Y41.

In total, 1265 grams of -12/+16 overcoated particles were produced by overcoating TRISO aliquots Y01-Y41. "-12/+16" overcoated particles are those that pass through an ASTM E11 No. 12 sieve (1.70 mm nominal opening) but do not pass through an ASTM E11 No. 16 sieve (1.18 mm nominal opening). The 1265 grams of sieved overcoated particles was tabled and 1169 grams of Bin 3 particles were recovered. "Bin 3" particles are those particles that end up in the third bin of a shape separation inclined table; these are the most spherical overcoated particles. 1169 grams of Bin 3 overcoated particles was determined to be a sufficient quantity to produce at least 180 compacts, based on preliminary calculations. The total number of compacts required for acceptance testing, irradiation, and spares was 167.

After overcoating, the overcoated particles from Y01-Y41 were combined and homogenized into an overcoated particle composite. The overcoated particle composite was labeled LEU09-OP2 and AGR-CHAR-PIP-11, Rev. 0, "Product Inspection Plan for AGR-2 Overcoated Particles for Compacting" was completed. This plan calls for measurement of average overcoated particle weight and diameter. The results of the PIP-11 inspection are reported in section 7. The plan also calls for riffling of compact charges for pressing.

Based on the average uranium loading determined for the LEU09 particles of 3.964E-4 g (section 5), 3191 particles would be needed in each compact to obtain an average uranium loading of 1.265 g for the compacts (the specified loading in SPC-923 was 1.265 ± 0.07 g). However, for consistency with the LEU06-OP1-Z compact lot (see LEU06-OP1-Z compacts data package ORNL/TM-2009/304) a target of 3200 particles per compact was chosen. This compact charge was based on the measured average uranium loading for LEU06 particles of 3.953E-4 g. Note that both of these particle batches used the same kernel charge so the uranium loading was expected to be the same. The average LEU09-OP2 overcoated particle weight was measured to be 2.010E-3 g (section 6). Using this value, a compact charge of 6.4313 g was calculated in order to achieve a compact with a uranium loading of 1.265 ± 0.07 g. One hundred and eighty five compact charges were prepared and labeled LEU09-OP2-G001 through G185. A record of the weight of each compact charge can be found on data report form DRF-24D, in section 7.

Actual compact uranium loading was measured to be 1.257 ± 0.003 g. Twenty compacts were deconsolidated and the particles were counted as part of the x-ray analysis for possible uranium dispersion due to defective IPyC. The average number of particles per compact was determined to be 3176, 24 particles short of the target compact loading. This reduced number of particles per compact explains the slightly low uranium loading result. It is hypothesized that the reason for the undershoot in particles per compact was due to weight loss from the overcoated particles from evaporation of methanol and volatiles from the resin. Overcoated particles were kept in sealed containers as much as feasible during riffling of the compact charges. However, it is likely that the weight loss due to evaporation for the samples used to determine average particle weight was greater than for the overcoated particles weighed out into each compact charge. Therefore, the average overcoated particle weight used to calculate the target compact charge was slightly too low.

Note that all the uranium per particle measurements on the LEU06, LEU07 and LEU09 material were consistent to within the sampling error and measurement uncertainty, as expected given that the same kernel batch was used for both coating runs. Table 3-1 shows the measured average uranium content in the particles from the uranium analyses performed directly on the particles compared to that calculated from the analyses performed on the compacts divided by the average number of particles per compact.

Table 3-1: Average and standard deviation (± value) of four independent measurements of uranium per particle for LEU06, LEU07 and LEU09 particles.

	LEU06	LEU07	LEU09
grams U/particle based on particle analysis	$3.953 \pm 0.010 \cdot 10^{-4}$ g	$3.930 \pm 0.007 \cdot 10^{-4}$ g	$3.964 \pm 0.009 \cdot 10^{-4}$ g

grams U/particle based on compact analysis	$3.942 \pm 0.006 \cdot 10^{-4}$ g	$3.938 \pm 0.016 \cdot 10^{-4}$ g	$3.958 \pm 0.009 \cdot 10^{-4}$ g

The LEU09-OP2-G## compacting charges were formed into green compacts using a heated, double acting die and a Promess servo-press. Compacting was performed in accordance with AGR-COMP-SOP-3, Rev. 3, "Standard Operating Procedure for Compacting Using a Servo Press." The die was heated to 65°C and approximately 0.10 g of matrix was added to the top and bottom of the compact in order to create matrix "end caps." The end caps were formed with the compact by first pouring a matrix charge into the heated die, followed by the overcoated particles, and then a second charge of matrix. This forming method created a thin (less than 0.5 mm thick) fuel free zone on the ends of the compact, called end caps. In total, 185 green compacts were fabricated. The compacts retained the designation of the riffled charges, LEU09-OP2-G001 through G185. All 185 green compacts were carbonized and heat treated according to AGR-COMP-SOP-4, Rev. 0, "Standard Operating Procedure for Carbonizing Compacts," and AGR-COMP-SOP-5 Rev. 1, "Standard Operating Procedure for Heat-treating Compacts."

A significant change was made to the compacting equipment from the LEU06 and LEU07 campaigns to the LEU08, LEU09, and LEU11 campaigns. The Carver hydraulic press was replaced with a Promess servo-press. The Promess press provided pressing rate and piston displacement control to three decimal place accuracy. This enabled the pressing rate and compact length to be precisely set and repeated for each individual LEU09-OP2-G### compacting charge. The force for each compact was also recorded more accurately, to ± 2 lbs.-f. The switch from the Carver press to the Promess press is the reason the compacting procedure was rewritten and a new revision was issued.

After compacting, 167 compacts were selected from LEU09-OP2-G001 through G185 for use. Compacts with obvious processing defects, chips, or undesirable dimensions were sorted out and not included in the 167 compacts selected for the final fuel compact lot. This down-select was part of the compacting process and was performed prior to random selection of compacts for acceptance testing. It should be understood that the results in this section and the acceptance testing are only relevant for the final 167 compact lot from which random representative samples were drawn for characterization. As instructed in AGR-CHAR-PIP-12, Rev. 1, "Product Inspection Plan for AGR-2 UCO Fuel Compact Lots," these 167 compacts were randomized and relabeled as LEU09-OP2-Z001 through Z167. A record of the original G-number for each Z-numbered compact can be found on data report form DRF-24C, in section 7. After relabeling, the compacts were characterized for product acceptance according to product inspection plan PIP-12. This plan calls for measurement of compact length, diameter, mass, matrix density, uranium content, impurity content, and determination of defect fractions for exposed uranium, defective SiC, uranium dispersion due to defective IPyC, and defective OPyC.

AGR-2 Process Conditions

The LEU09-OP2-Z (AGR-2 UCO Variant) compact lot was made in accordance with the AGR-2 Fuel Specification (SPC-923, Rev. 3). The specified AGR-2 process limits are listed below.

Molding Pressure:	< 60 MPa
Carbonization parameters:	< 350ºC/hr in He atmosphere Hold at 950 ± 50ºC for 1.0 ± 0.4 hr Furnace cool
Heat treatment parameters:	~20ºC/min in vacuum (<1.3 Pa) Hold at 1650-1850ºC for 60 ± 10 min Furnace cool at ~20ºC/min to below 700ºC

Table 3-2 shows the process conditions used in molding the compacts, carbonizing the compacts, and heat treating the compacts. In the carbonization regime, the furnace was allowed to cool under no power (i.e., after holding at 950°C for 1 hour, power was turned off). In the heat treatment run, the furnace was cooled under power at 20°C/min until the furnace temperature reached 700°C, and then the furnace was allowed to cool under no power.

Table 3-2: Summary of process conditions used in making LEU09-OP2-Z (AGR-2 UCO Variant) compacts

Compact ID	Carbonization Parameter					Heat-treatment Parameters			
	Molding Pressure (MPa)	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere
LEU09-OP2-Z001	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z002	16.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z003	16.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z004	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z005	17.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z006	16.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z007	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z008	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z009	16.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z010	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z011	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z012	17.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z013	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z014	16.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z015	16.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z016	16.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z017	15.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z018	16.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z019	18.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z020	17.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z021	17.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z022	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z023	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z024	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z025	16.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z026	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z027	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z028	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z029	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z030	16.9	4.7	950	1	flowing He	20	1800	1	vacuum

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Table 3-2 (cont.): Summary of process conditions used in making LEU09-OP2-Z (AGR-2 UCO Variant) compacts

Compact ID	Carbonization Parameter					Heat-treatment Parameters			
	Molding Pressure (MPa)	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere
LEU09-OP2-Z031	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z032	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z033	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z034	16.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z035	16.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z036	17.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z037	16.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z038	15.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z039	17.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z040	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z041	17.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z042	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z043	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z044	17.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z045	16.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z046	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z047	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z048	17.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z049	16.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z050	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z051	17.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z052	17.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z053	16.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z054	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z055	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z056	17.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z057	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z058	16.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z059	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z060	16.7	4.7	950	1	flowing He	20	1800	1	vacuum

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Table 3-2 (cont.): Summary of process conditions used in making LEU09-OP2-Z (AGR-2 UCO Variant) compacts

Compact ID	Carbonization Parameter					Heat-treatment Parameters			
	Molding Pressure (MPa)	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere
LEU09-OP2-Z061	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z062	16.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z063	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z064	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z065	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z066	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z067	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z068	17.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z069	17.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z070	16.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z071	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z072	17.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z073	16.5	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z074	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z075	17.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z076	17.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z077	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z078	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z079	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z080	16.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z081	17.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z082	17.5	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z083	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z084	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z085	16.5	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z086	16.5	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z087	17.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z088	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z089	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z090	16.1	4.7	950	1	flowing He	20	1800	1	vacuum

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Table 3-2 (cont.): Summary of process conditions used in making LEU09-OP2-Z (AGR-2 UCO Variant) compacts

Compact ID	Carbonization Parameter					Heat-treatment Parameters			
	Molding Pressure (MPa)	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere
LEU09-OP2-Z091	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z092	17.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z093	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z094	16.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z095	16.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z096	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z097	18.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z098	16.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z099	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z100	16.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z101	17.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z102	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z103	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z104	17.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z105	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z106	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z107	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z108	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z109	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z110	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z111	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z112	16.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z113	16.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z114	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z115	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z116	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z117	17.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z118	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z119	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z120	17.5	4.7	950	1	flowing He	20	1800	1	vacuum

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Table 3-2 (cont.): Summary of process conditions used in making LEU09-OP2-Z (AGR-2 UCO Variant) compacts

Compact ID	Carbonization Parameter					Heat-treatment Parameters			
	Molding Pressure (MPa)	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere
LEU09-OP2-Z121	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z122	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z123	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z124	16.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z125	17.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z126	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z127	16.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z128	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z129	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z130	16.5	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z131	16.5	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z132	17.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z133	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z134	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z135	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z136	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z137	17.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z138	17.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z139	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z140	17.5	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z141	16.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z142	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z143	16.2	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z144	16.5	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z145	16.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z146	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z147	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z148	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z149	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z150	16.6	4.7	950	1	flowing He	20	1800	1	vacuum

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Table 3-2 (cont.): Summary of process conditions used in making LEU09-OP2-Z (AGR-2 UCO Variant) compacts

Compact ID	Carbonization Parameter					Heat-treatment Parameters			
	Molding Pressure (MPa)	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere	Heating Rate (°C/min.)	Max. Temp. (°C)	Hold Time (hrs.)	Atmosphere
LEU09-OP2-Z151	16.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z152	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z153	17.4	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z154	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z155	16.8	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z156	17.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z157	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z158	16.6	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z159	17.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z160	17.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z161	16.1	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z162	16.0	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z163	17.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z164	16.7	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z165	16.9	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z166	16.3	4.7	950	1	flowing He	20	1800	1	vacuum
LEU09-OP2-Z167	16.4	4.7	950	1	flowing He	20	1800	1	vacuum

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QAS Review M.C. Date 2/05/10

4 Impurity analysis of matrix, resin, and graphites

The AGR-2 Fuel Specification (SPC-923) puts maximum limits on the elemental impurities Al, Ca, Ti, V, Cr, Mn, Fe, Co, and Ni. The natural graphite, synthetic graphite, and thermosetting resin used to make the matrix/overcoat material may contain these impurities. Therefore, the selection of graphites and resin used to make the matrix must have low concentrations of these impurities to ensure that the compacts made from the matrix will be within specification. Subsequently, part of the compacting development effort was selection and qualification of natural graphite, synthetic graphite, and resin. A graphite or resin was considered "qualified" if it could produce a compact that was within specification on impurities. The AGR-1 compacts showed that compacts could be made from these matrix constituents and pass the impurity specification (see AGR-1 Baseline Compact Lot LEU01-46T-Z data compilation ORNL/TM-2006/507, for instance). The qualification process involved receiving natural graphite and synthetic graphite and testing them via glow discharge mass spectrometry (GDMS) in order to establish their initial impurity concentrations. The graphites and resin were then combined to produce matrix that was carbonized and heat treated in powder form. The impurity levels in the heat treated matrix was then also measured by GDMS.

Table 4-1 shows the initial impurity levels for the natural graphite and synthetic graphite that were used to make LEU09-OP2-Z compacts. Natural graphite (Asbury Graphite Mills RD13371), synthetic graphite (SGL Carbon KRB2000), and thermosetting resin (Hexion Durite SC1008-lot LK9DA0008) were combined in a weight ratio of 64:16:20 to make the matrix. Three batches of matrix were produced: RDKrS-050809, RDKrS-052109, and RDKrS-060109. A sample of the RDKrS-050809 matrix was carbonized and heat treated in powder form prior to being tested for impurities by GDMS. The other matrix batches were not tested because they were made up of the same starting materials. Notice that the heat treatment processes significantly reduced impurity levels in the matrix for several elements.

Table 4-1: Matrix constituents that were used in AGR-2 LEU09-OP2-Z compacts

Element	Impurity concentration (ppm)		
	Natural Graphite-RD13371	Synthetic Graphite-KRB2000	Heat treated Matrix-RDKrS-050809
Element	Concentration (ppm)	Concentration (ppm)	Concentration (ppm)
Al	36	0.35	1.2
Ca	9.4	0.7	0.51
Ti	0.43	0.06	0.92
V	0.6	0.02	8.8
Cr	4.5	<0.5	<0.5
Mn	0.54	<0.05	<0.05
Fe	34	1.4	0.11
Co	<0.05	0.25	<0.05
Ni	0.37	1.2	<0.1

The following pages show the impurity analysis reports for the natural graphite, synthetic graphite, and matrix sample listed in Table 4-1. Also attached is the certificate of analysis for the resin from Hexion. Note that an expiration date was set for the resin of 6 months from the manufacture date. LEU09-OP2-Z compacting was completed on 6/23/09.

SHIVA TECHNOLOGIES
6707 Brooklawn Parkway
Syracuse, New York 13211

GDMS
ANALYTICAL REPORT

Telephone (315)431-9900
FAX (315) 431-9800
E-mail info@shivatec.com

ORNL/TM-2010/017

Customer: **UT-Battelle Oak Ridge** *P.O. #* **MCH4-0191**
Date: 27-Dec-03 *Job #* UM4335

Customer ID: **Graphite** *Shiva ID:* U031218080
AGM RD13371

Element	Concentration [ppm wt]	Element	Concentration [ppm wt]
Li	< 0.01	Pd	< 0.1
Be	< 0.01	Ag	< 0.1
B	0.17	Cd	< 0.1
C	Matrix	In	Binder
N	-	Sn	< 0.5
O	-	Sb	< 0.5
F	< 5	Te	< 0.1
Na	2.9	I	< 0.1
Mg	4.8	Cs	< 0.1
Al	36	Ba	13
Si	240	La	< 0.5
P	1.6	Ce	0.08
S	85	Pr	< 0.05
Cl	0.8	Nd	< 0.05
K	1.5	Sm	< 0.05
Ca	9.4	Eu	< 0.05
Sc	< 0.05	Gd	< 0.05
Ti	0.43	Tb	< 0.05
V	0.6	Dy	< 0.05
Cr	4.5	Ho	< 0.05
Mn	0.54	Er	< 0.05
Fe	34	Tm	< 0.05
Co	< 0.05	Yb	< 0.05
Ni	0.37	Lu	< 0.05
Cu	1.7	Hf	< 0.05
Zn	< 0.1	Ta	< 5
Ga	< 0.1	W	3.1
Ge	< 0.1	Re	< 0.05
As	< 0.1	Os	< 0.05
Se	< 0.1	Ir	< 0.05
Br	< 0.1	Pt	< 0.05
Rb	< 0.05	Au	< 0.1
Sr	0.19	Hg	< 0.5
Y	0.95	Tl	< 0.1
Zr	0.26	Pb	< 0.5
Nb	< 0.1	Bi	< 0.1
Mo	< 0.05	Th	< 0.05
Ru	< 0.1	U	< 0.05
Rh	< 0.1		

AN ISO 9002 Registered Company

Reviewed by David Shum

SHIVA TECHNOLOGIES
6707 Brooklawn Parkway
Syracuse, New York 13211

GDMS
ANALYTICAL REPORT

Telephone (315)431-9900
FAX (315) 431-9800
E-mail info@shivatec.com

ORNL/TM-2010/017

Customer: **UT-Battelle Oak Ridge** *P.O. #* **MCH4-0191**
Date: 26-Dec-03 *Job #* UM4335

Customer ID: **Graphite SGL** *Shiva ID:* U031218078

Element	Concentration [ppm wt]	Element	Concentration [ppm wt]
Li	< 0.01	Pd	< 0.1
Be	< 0.01	Ag	< 0.1
B	2.1	Cd	< 0.1
C	Matrix	In	Binder
N	-	Sn	< 0.5
O	-	Sb	< 0.5
F	< 5	Te	< 0.1
Na	0.45	I	< 0.5
Mg	0.2	Cs	< 0.5
Al	0.35	Ba	< 0.1
Si	3.1	La	< 0.5
P	0.11	Ce	< 0.05
S	9	Pr	< 0.05
Cl	3.2	Nd	< 0.05
K	0.45	Sm	< 0.05
Ca	0.7	Eu	< 0.05
Sc	< 0.05	Gd	< 0.05
Ti	0.06	Tb	< 0.05
V	0.02	Dy	< 0.05
Cr	< 0.5	Ho	< 0.05
Mn	< 0.05	Er	< 0.05
Fe	1.4	Tm	< 0.05
Co	0.25	Yb	< 0.05
Ni	1.2	Lu	< 0.05
Cu	< 0.5	Hf	< 0.05
Zn	< 0.5	Ta	< 5
Ga	< 0.1	W	2.7
Ge	< 0.1	Re	< 0.05
As	< 0.1	Os	< 0.05
Se	< 0.1	Ir	< 0.05
Br	< 0.1	Pt	< 0.05
Rb	< 0.05	Au	< 0.1
Sr	< 0.05	Hg	< 0.5
Y	< 0.05	Tl	< 0.1
Zr	< 0.05	Pb	< 0.5
Nb	< 0.1	Bi	< 0.1
Mo	< 0.05	Th	< 0.05
Ru	< 0.1	U	< 0.05
Rh	< 0.1		

AN ISO 9002 Registered Company

Reviewed by David Shum

EAG Evans Analytical Group

GDMS
ANALYTICAL REPORT

SHIVA Technologies
An Operating Unit of Evans Analytical Group LLC
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Syracuse, New York 13211

Telephone (315) 431-9900
Fax: (315) 431-9800
Email: info@eaglabs.com
www.eaglabs.com

Customer: **UT-Battelle Oak Ridge** *P.O.#* **CC**

Date: 20-May-09 *Job #* S09X3653

Customer ID: **Graphite** *Shiva ID:* S090514036
RDKrS050809

Element	Concentration [ppm wt]	Element	Concentration [ppm wt]
Li	< 0.01	Pd	< 0.1
Be	< 0.01	Ag	< 0.1
B	0.46	Cd	< 0.1
C	Matrix	In	Binder
N	-	Sn	< 0.5
O	-	Sb	< 0.5
F	< 5	Te	< 0.1
Na	0.08	I	< 20
Mg	< 0.5	Cs	< 0.1
Al	1.2	Ba	8.3
Si	29	La	< 0.5
P	0.25	Ce	< 0.5
S	2.9	Pr	< 0.05
Cl	2.3	Nd	< 0.05
K	< 0.1	Sm	< 0.05
Ca	0.51	Eu	< 0.05
Sc	< 0.05	Gd	< 0.05
Ti	0.92	Tb	< 0.05
V	8.8	Dy	< 0.05
Cr	< 0.5	Ho	< 0.05
Mn	< 0.05	Er	< 0.05
Fe	0.11	Tm	< 0.05
Co	< 0.05	Yb	< 0.05
Ni	< 0.1	Lu	< 0.05
Cu	< 0.1	Hf	< 0.05
Zn	< 0.1	Ta	< 5
Ga	< 0.1	W	0.41
Ge	< 0.1	Re	< 0.05
As	< 0.1	Os	< 0.05
Se	< 0.1	Ir	< 0.05
Br	< 0.1	Pt	< 0.05
Rb	< 0.05	Au	< 0.1
Sr	< 0.05	Hg	< 0.5
Y	< 0.05	Tl	< 0.1
Zr	0.65	Pb	< 0.5
Nb	< 0.1	Bi	< 0.1
Mo	< 0.05	Th	< 0.05
Ru	< 0.1	U	< 0.05
Rh	< 0.1		

Joseph Salvador

Accreditations: ISO/IEC 17025, Nadcap Reviewed by _____

HEXION Hexion Specialty Chemicals, Inc.

Certificate of Analysis

Customer #: 32710
Customer Address:
CAPITAL RESIN CORPORATION
324 DERING AVENUE
COLUMBUS OH 43207
USA

Ship Date: 04/29/2009
DDN: 82577120
Customer - PO#: 901656
Date of MFG: 04/28/2009

Oct 27, 2009
shelf life

Attention: KAY FREY
Customer Phone #: 614-445-7177
Customer Fax #: 614-445-7290

SAP Product #: 305922

Product Description: Durite SC-1008
DS3271/450#

Property	Value	Units	Specification Ranges		Test Method
Lot Number: LK9DA0008					
pH, 25C	7.97		7.90	8.50	IR-034
Specific Gravity	1.0825		1.0700	1.1000	IR-026
Viscosity	258	cPs	180	300	IR-111
In-process Tests	Passes	-	-	-	
Solids, Phenolic (ISO)	61.83	%	60.00	64.00	IR-063

CERTIFICATE OF COMPLIANCE
It is hereby certified that Hexion's Phenolic Resin, SC-1008, shipped in this lot has been produced in accordance with Military specification (Resin, Phenolic, Laminating) MIL-R9299C, Grades A and B, dated December 3, 1968. It is recommended that SC-1008 be stored in a cool place. Storage life is materially increased by refrigerated storage. SC-1008 has a usable life of one month at 70 degrees F and six months at 40 degrees F.
Fax to Aram at 201-566-4303

Lois A Toby
Quality Assurance

An ISO9001:2000 Certified Company

SHIPPED FROM: Hexion Specialty Chemicals • 6200 Campground Road
Louisville, KY 40216 • Phone: 502-449-6563

5 Characterization of coated particles

This section contains characterization data on the TRISO particle lot LEU09. The data was obtained according to product inspection plan AGR-CHAR-PIP-10R2, "Product Inspection Plan for AGR-2 Particles for Compacting - Preliminary Measurements." The data obtained by this inspection plan is used in support of compact fabrication and for input into measurements made for compact acceptance testing. There are no direct specifications for the measured parameters.

LEU09 particles were obtained from the G73J-14-93073A coated particle batch by riffling a sample using a chute splitter. Prior to performing AGR-CHAR-PIP-10R2, the particles were sorted by size using a roller-micrometer (see Appendix C) and then washed in methanol. No uncoated kernels or coating fragments were found, but 14 small or highly faceted particles were segregated out and removed. PIP-10 calls for measurement of average particle weight, diameter, envelope volume, and uranium content. OPyC open porosity is also obtained as part of the envelope volume analysis and reported for information only. The plan also calls for riffling of 20 gram aliquots for use as overcoater charges. Riffling at ORNL was done using a 10 position rotary riffler. After riffling out the characterization samples, forty-eight overcoater charges were prepared and labeled LEU09-Y01 through LEU09-Y48. Additional ORNL characterization performed on another sample taken from G73J-14-93073A is provided in ORNL/TM-2008/134, "Data Compilation for AGR-2 UCO Variant Coated Particle Batch G73J-14-93073A."

The following pages show the inspection report form (IRF-10) for the LEU09 particles. Following the IRF-10 inspection report form, which summarizes the results, are the individual data report forms for the measurements that were performed.

Inspection Report Form IRF-10: AGR-2 Particles for Compacting – Preliminary Measurements

Procedure:	AGR-CHAR-PIP-10 Rev. 2
Coated particle composite ID:	LEU09
Coated particle composite description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A

Property	Measured Data				Specification	Acceptance Criteria	Acceptance Test Value	Pass or fail	Data Records
	Mean (x)	Std. Dev. (s)	# measured (n)	t value	INL SPC-923				
Particle diameter (μm)	873.2	23	2003	1.646	Not Applicable				DRF-07 DRF-10
Average particle weight (g)	1.032E-03				Not Applicable				DRF-22
Average particle envelope volume (cm^3)	3.43E-04				Not Applicable				DRF-31
OPyC open porosity (ml/m^2)	0.234				Not Applicable				DRF-31
Average uranium per particle (g)	3.964E-04				Not Applicable				DRF-35

Comments

John Thum — QC Supervisor

10-19-09 — Date

M. C. [illegible] — QA Reviewer

2/03/10 — Date

Data Report Form DRF-07: Imaging of Particle Diameter and Aspect Ratio Using an Optical Microscope System

Procedure:	AGR-CHAR-DAM-07 Rev. 1
Operator:	Andrew Kercher
Sample ID:	LEU09-B01
Sample Description:	AGR-2 UCO Variant, from G73J-14-93073A
Folder name containing images:	\\Mc-agr\AGR\ImageProcessing\P09051401\

DMR Calibration Expiration Date:	10/28/2009
Stage Micrometer Calibration Expiration Date:	2/10/2014
Measured Value for 1200 µm in Stage Micrometer Image:	1200. µm

Operator

May 14, 2009

Date

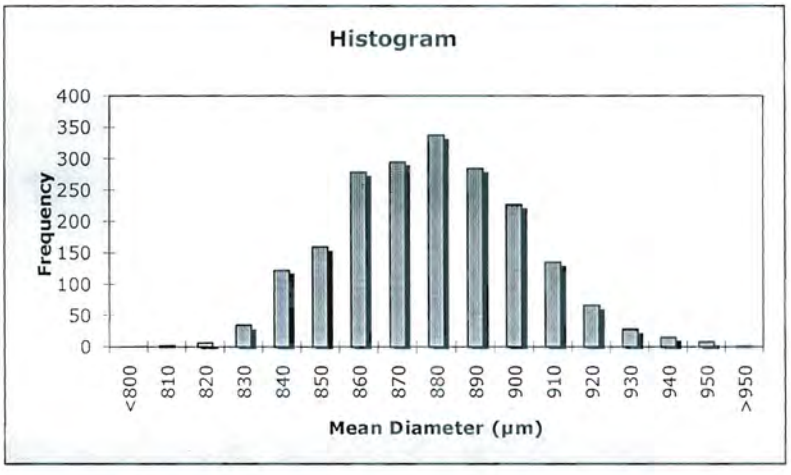
Data Report Form DRF-10A: Measurement of Particle Diameter

Procedure:	AGR-CHAR-DAM-10 Rev. 2
Operator:	Andrew K. Kercher
Folder name containing images:	\\mc-agr\AGR\ImageProcessing\Completed_Shadow\P09051401\
Sample ID:	LEU09-B01
Sample Description:	AGR-2 UCO Variant, from G73J-14-93073A
Folder name containing processed data:	\\mc-agr\AGR\ImageProcessing\Completed_Shadow\P09051401_output\

Number of particles analyzed:	2003
Mean of the average diameter of each particle (μm)	873.2
Standard deviation in the average diameter of each particle (μm)	23

Distribution of the average particle diameter (top binned)

Mean Diameter (μm)	*Frequency*
<800	0
810	2
820	7
830	35
840	122
850	160
860	279
870	295
880	338
890	285
900	227
910	135
920	66
930	28
940	15
950	8
>950	1



Andrew K. Kercher
Operator

May 15, 2009
Date

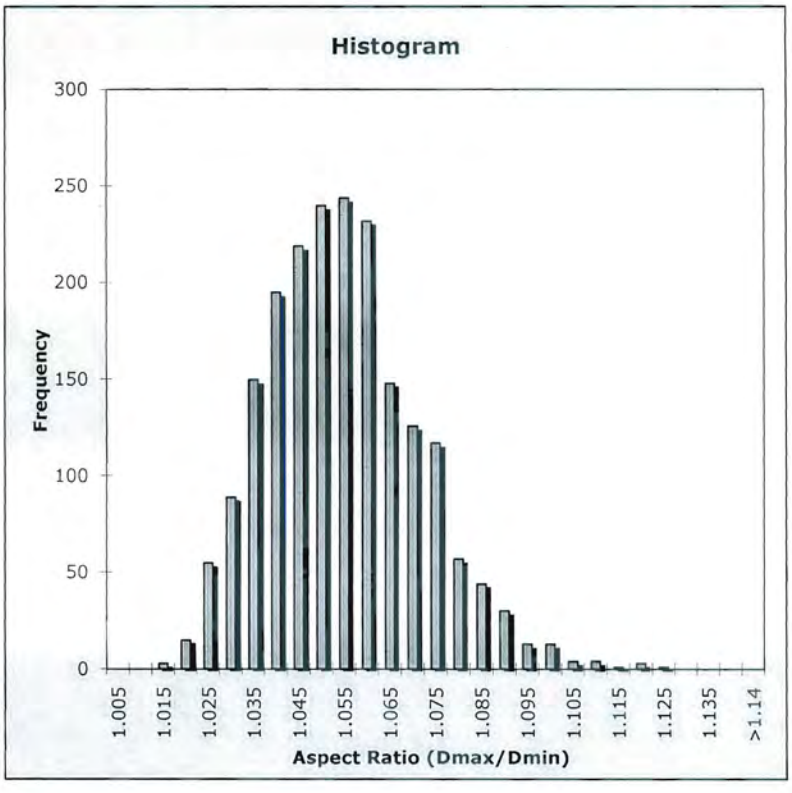
Data Report Form DRF-10B: Measurement of Particle Aspect Ratio (Dmax/Dmin)

Procedure:	AGR-CHAR-DAM-10 Rev. 2
Operator:	Andrew K. Kercher
Folder name containing images:	\\mc-agr\AGR\ImageProcessing\Completed_Shadow\P09051401\
Sample ID:	LEU09-B01
Sample Description:	AGR-2 UCO Variant, from G73J-14-93073A
Folder name containing processed data:	\\mc-agr\AGR\ImageProcessing\Completed_Shadow\P09051401_output\

Number of particles analyzed:	2003
Number of particles with aspect ratio ≥ 1.14	0
Average particle aspect ratio:	1.052

Distribution of the aspect ratio (top binned)

Aspect Ratio (D)	*Frequency*
1.005	0
1.010	0
1.015	3
1.020	15
1.025	55
1.030	89
1.035	150
1.040	195
1.045	219
1.050	240
1.055	244
1.060	232
1.065	148
1.070	126
1.075	117
1.080	57
1.085	44
1.090	30
1.095	13
1.100	13
1.105	4
1.110	4
1.115	1
1.120	3
1.125	1
1.130	0
1.135	0
1.140	0
>1.14	0



Operator

May 15, 2009

Date

Data Report Form DRF-22: Estimation of Average Particle Weight

Procedure:	AGR-CHAR-DAM-22 Rev. 1
Operator:	Dixie Barker
Particle Lot ID:	LEU09
Particle Lot Description:	AGR-2 UCO Variant, from G73J-14-93073A
Filename:	\\mc-agr\AGR\ParticleWeight\W09050701_DRF22R1.xls

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Weight of particles (g):	0.1555	0.1661	0.1718	0.1616	0.1708
Number of particles:	151	161	166	156	166
Average weight/particle (g):	1.030E-03	1.032E-03	1.035E-03	1.036E-03	1.029E-03

Mean average weight/particle (g):	1.032E-03
Standard error in mean average weight/particle (g):	1.38E-06

Dixie Barker
Operator

6-3-09
Date

Data Report Form DRF-31: Measurement of Open Porosity using a Mercury Porosimeter

Procedure:	AGR-CHAR-DAM-31 Rev. 1
Operator:	S. D. Nunn
Coated particle batch ID:	LEU09-D01
Batch Description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Thermocouple Expiration Date:	4/2/10
Penetrometer Expiration Date:	7/10/09
Completed DRF Filename:	\\mc-agr\AGR\Porosimeter\S09070801\S09070801_DRF31R1.xls

Mean average weight/particle (g):	1.03E-03
Standard error in mean average weight/particle (g):	1.38E-06

Weight of particles (g):	3.9115
Approximate number of particles:	3790
Uncertainty in number of particles:	5
Total envelope volume of sample (cc):	1.300
Average envelope volume/particle (cc):	3.43E-04
Sample envelope density (g/cc):	3.009

Average particle diameter (microns):	8.69E+02
Average surface area/particle (cm2):	2.37E-02
Total sample surface area (cm2):	8.98E+01
Intruded mercury volume from 250-10,000 psia (cc):	2.10E-03
Open porosity (ml/m2):	2.34E-01

Comments

S.D. Nunn — Operator

7/8/09 — Date

Data Report Form DRF-35: Fuel Particle Uranium Loading

Procedure:	AGR-CHAR-DAM-35 Rev. 0
Operator:	Fred Montgomery
Particle lot ID:	LEU09
Particle lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\UraniumLoading\LEU09_DRF35R0.xls

Mean average weight per particle (g):	1.032E-03
Standard error in mean average weight per particle (g):	1.4E-06

	Sample 1		Sample 2		Sample 3	
	Leach 1	Leach 2	Leach 1	Leach 2	Leach 1	Leach 2
Particle sample ID:	LEU09-E01		LEU09-F01		LEU09-G01	
Weight of particles:	4.0611		4.0691		3.9767	
Approximate number of particles:	3935		3943		3853	
Uncertainty in number of particles:	5		5		5	
Acid leach sample ID:	U09052001	U09052201	U09052002	U09052202	U09052003	U09052203
Radiochemical laboratory analysis number:	1937-001	1939-007	1937-002	1939-008	1937-003	1939-009
Weight U in leach (mg):	1557	1.744	1558	0.300	1533	0.536
Uncertainty in weight U in leach (mg):	6	0.174	6.2	0.030	6.1	0.054
Total weight U in sample (mg):	1559		1558		1533	
Average weight U per particle (mg):	0.3962		0.3951		0.3979	
Uncertainty in average weight U per particle (mg):	0.0017		0.0017		0.0017	

Mean average uranium loading per particle (g):	3.964E-04
Standard error in mean average uranium loading per particle (g):	8.1E-07

Comments
Leach 1 was analyzed by Davies-Gray titration method. Leach 2 was analyzed by ICP-MS, due to low U concentration.
Davies-Gray: initial known U recovery = 100.66%; final known U recovery=100.87%; blind titration U recovery=100.33%
Uncertainty in Davies-Gray (0.4%) based on average of measured % recovery data for LEU06,07,08,09.
Data checked by FCM against official results of analyses for RMAL1937 on 6/19/2009 and against RMAL1939 on 7/20/2009

Fred C. Montgomery
Operator

10-19-2009
Date

6 Characterization of overcoated particles

This section contains characterization data on the overcoated particle lot LEU09-OP2. The data was obtained according to product inspection plan AGR-CHAR-PIP-11R0, "Product Inspection Plan for AGR-2 Overcoated Particles for Compacting." The data obtained by this inspection plan is used in support of compact fabrication and for input into measurements made for compact acceptance testing. There are no direct specifications for the measured parameters.

After overcoating, the overcoated particles from LEU09-Y01 through LEU09-Y41 were combined and homogenized into an overcoated particle composite. The overcoated particle composite was labeled LEU09-OP2 and AGR-CHAR-PIP-11R0 was completed. This plan calls for measurement of average overcoated particle weight and diameter. The plan also calls for riffling of compact charges for pressing. One hundred and eighty five compact charges were prepared and labeled LEU09-OP2-G001 through LEU09-OP2-G185. A record of the weight of each compact charge can be found on data report form DRF-24D, in section 7.

The following pages show the inspection report form (IRF-11) for the LEU09-OP2 overcoated particles. Following the IRF-11 inspection report form, which summarizes the results, are the individual data report forms for the measurements that were performed.

The average thickness of the overcoat can be estimated from the increase in the average particle size after overcoating, (1303 μm - 873 μm)/2 = 215 μm. The increase in average particle weight was (2.010 mg - 1.032 mg) = 0.978 mg. From these values, the average density of the overcoating prior to compacting can be estimated to be 1.21 g/cm^3.

Inspection Report Form IRF-11: AGR-2 Overcoated Particles for Compacting

Procedure:	AGR-CHAR-PIP-11 Rev. 0
Overcoated particle composite ID:	LEU09-OP2
Overcoated particle composite description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A

Property	Measured Data				Specification	Acceptance Criteria	Acceptance Test Value	Pass or fail	Data Records
	Mean (x)	Std. Dev. (s)	# measured (n)	t value	INL SPC-923				
Overcoated particle diameter (µm)	1303.4	74	905	1.647	Not Applicable				DRF-29 DRF-30
Average overcoated particle weight (g)	2.010E-03				Not Applicable				DRF-22

Comments
Overcoated particle weight from combined results of 2 independent measurements (W09060801 and W090060802).

QC Supervisor

10-19-09
Date

QA Reviewer

2/03/10
Date

Data Report Form DRF-29: Imaging of Overcoated Particle Diameter and Aspect Ratio Using an Optical Microscope System

Procedure:	AGR-CHAR-DAM-29 Rev. 1
Operator:	Andrew K. Kercher
Sample ID:	LEU09-OP2-B01
Sample Description:	AGR-2 UCO Variant, from G73J-14-93073A
Folder name containing images:	\\mc-agr\AGR\ImageProcessing\P09081301\

DMR Calibration Expiration Date:	10/28/2009
Stage Micrometer Calibration Expiration Date:	2/10/2014
Measured Value for 2500 µm in Stage Micrometer Image:	2500. µm

Andrew K. Kercher — Operator

August 13, 2009 — Date

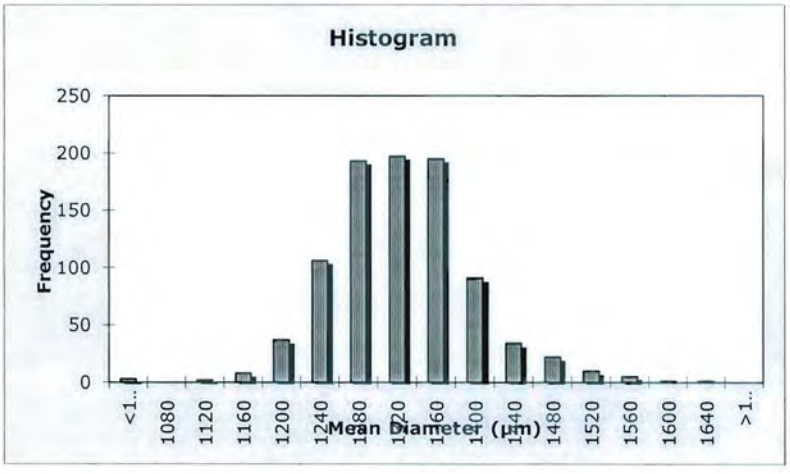
Data Report Form DRF-30A: Measurement of Over-coated Particle Diameter

Procedure:	AGR-CHAR-DAM-30 Rev. 0
Operator:	Andrew K. Kercher
Folder name containing images:	\\mc-agr\AGR\ImageProcessing\Completed_Shadow\P09081301
Sample ID:	LEU09-OP2-B01
Sample Description:	AGR-2 UCO Variant, from G73J-14-93073A
Folder name containing processed data:	\\mc-agr\AGR\ImageProcessing\Completed_Shadow\P09081301_output\

Number of particles analyzed:	905
Mean of the average diameter of each particle (μm)	1303.4
Standard deviation in the average diameter of each particle (μm):	74

Distribution of the average particle diameter (top binned)

Mean Diameter (μm)	*Frequency*
<1040	3
1080	0
1120	2
1160	8
1200	37
1240	106
1280	193
1320	197
1360	195
1400	91
1440	34
1480	22
1520	10
1560	5
1600	1
1640	1
>1640	0



Andrew K. Kercher
Operator

August 20, 2009
Date

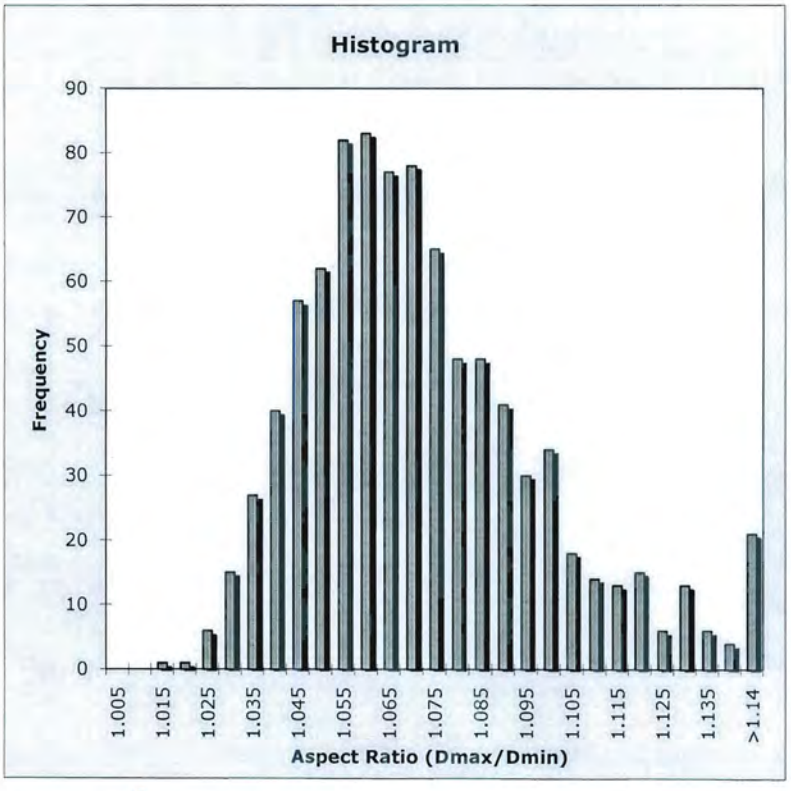
Data Report Form DRF-30B: Measurement of Over-coated Particle Aspect Ratio (Dmax/Dmin)

Procedure:	AGR-CHAR-DAM-30 Rev. 0
Operator:	Andrew K. Kercher
Folder name containing images:	\\mc-agr\AGR\ImageProcessing\Completed_Shadow\P09081301
Sample ID:	LEU09-OP2-B01
Sample Description:	AGR-2 UCO Variant, from G73J-14-93073A
Folder name containing processed data:	\\mc-agr\AGR\ImageProcessing\Completed_Shadow\P09081301_output\

Number of particles analyzed:	905
Average particle aspect ratio:	1.071

Distribution of the aspect ratio (top binned)

Aspect Ratio (D)	*Frequency*
1.005	0
1.010	0
1.015	1
1.020	1
1.025	6
1.030	15
1.035	27
1.040	40
1.045	57
1.050	62
1.055	82
1.060	83
1.065	77
1.070	78
1.075	65
1.080	48
1.085	48
1.090	41
1.095	30
1.100	34
1.105	18
1.110	14
1.115	13
1.120	15
1.125	6
1.130	13
1.135	6
1.140	4
>1.14	21



Andrew K. Kercher — Operator

August 20, 2009 — Date

Data Report Form DRF-22: Estimation of Average Particle Weight

Procedure:	AGR-CHAR-DAM-22 Rev. 1
Operator:	Dixie Barker
Particle Lot ID:	LEU09-OP2
Particle Lot Description:	AGR-2 UCO Variant, from G73J-14-93073A
Filename:	\\mc-agr\AGR\ParticleWeight\W09060801_DRF22R1.xls

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Weight of particles (g):	0.3009	0.3340	0.2682	0.2966	0.3240
Number of particles:	151	162	132	149	162
Average weight/particle (g):	1.993E-03	2.062E-03	2.032E-03	1.991E-03	2.000E-03

Mean average weight/particle (g):	2.015E-03
Standard error in mean average weight/particle (g):	1.38E-05

Dixie Barker
Operator

6-8-09
Date

Data Report Form DRF-22: Estimation of Average Particle Weight

Procedure:	AGR-CHAR-DAM-22 Rev. 1
Operator:	Dixie Barker
Particle Lot ID:	LEU09-OP2
Particle Lot Description:	AGR-2 UCO Variant, from G73J-14-93073A
Filename:	\\mc-agr\AGR\ParticleWeight\W09060802_DRF22R1.xls

	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10
Weight of particles (g):	0.2609	0.2581	0.2918	0.2500	0.3063
Number of particles:	129	131	144	125	153
Average weight/particle (g):	2.022E-03	1.970E-03	2.026E-03	2.000E-03	2.002E-03

Mean average weight/particle (g):	2.004E-03
Standard error in mean average weight/particle (g):	1.00E-05

Dixie Barker
Operator

6-8-09
Date

7 Characterization of compacts

This section contains acceptance testing data on the compact lot LEU09-OP2-Z. The data was obtained according to product inspection plan AGR-CHAR-PIP-12R1, "Product Inspection Plan for AGR-2 UCO Fuel Compact Lots." This compact lot was determined to not fully satisfy the specifications in section 3.3 of the AGR-2 Fuel Specification (INL SPC-923, Rev. 3). All specification were satisfied except for a higher than allowed fraction of exposed uranium, discussed below. However, it was determined by the program that the observed uranium contamination fraction non-conformance was acceptable for "use as is" in the AGR-2 irradiation test. This disposition was documented on INL NCR-44791.

After compacting, 167 compacts were selected from LEU09-OP2-G001 through G185 for use. Compacts with obvious processing defects, chips, or undesirable dimensions were sorted out and not included in the 167 compacts selected for the final fuel compact lot. This down-select was part of the compacting process and was performed prior to random selection of compacts for acceptance testing. It should be understood that the results in this section and the acceptance testing are only relevant for the final 167 compact lot from which random representative samples were drawn for characterization. As instructed in AGR-CHAR-PIP-12R1, these 167 compacts were randomized and relabeled as LEU09-OP2-Z001 through Z167. A record of the original G-number for each Z-numbered compact can be found on data report form DRF-24C, in this section. After relabeling, the compacts were characterized for product acceptance according to product inspection plan PIP-12. This plan calls for measurement of compact length, diameter, mass, matrix density, uranium content, impurity content, and determination of defect fractions for exposed uranium, defective SiC, uranium dispersion due to defective IPyC, and defective OPyC.

The following pages show the inspection report forms (IRF-12A, IRF-12B, IRF-12C, IRF-12D) for the LEU09-OP2-Z compacts. Following the IRF-12 inspection report forms, which summarize the results, are the individual data report forms for the measurements that were performed. Note that the leach-burn-leach (LBL) analysis is performed on sets of 20 compacts at a time, in four sample groups with 5 compacts in each sample. Inspection report forms IRF-12B, IRF-12C, and IRF-12D summarize the results from each set of 20 compacts. Inspection report form IRF-12A summarizes all the analyses. The mean and standard deviation for the impurity analyses (IRF-12B), the uranium contamination fraction or effective number of exposed kernels before the burn (IRF-12C), and the defective SiC coating fraction or number of exposed kernels after the burn (IRF-12D) are calculated from the combined results of all the relevant sample groups. These combined results, which are then entered into IRF-12A, are provided in Table 7-1 and Table 7-2 below. Note that, for some sets of 20 compacts, only pre-burn leach analysis is performed. This is because the uranium contamination defect fraction is specified at a lower allowable maximum population, which requires a greater number of particles be analyzed in order to demonstrate product acceptance. Pre-burn leach analysis was completed on 100 compacts. Post-burn leach analysis was completed on 80 compacts. The third set of 20 compacts did not undergo post-burn leach analysis, and therefore did not contribute to the total impurity analysis or defective SiC analysis.

Table 7-1: Summary of impurity analysis for LEU09-OP2-Z compacts

Compact ID numbers:	011, 152, 001, 068, 046	067, 081, 019, 008, 032	039, 036, 155, 012, 117	031, 149, 093, 147, 072	051, 086, 143, 097, 033	030, 024, 090, 013, 010	021, 035, 121, 107, 061	151, 003, 058, 080, 009	Mean	Standard Deviation
Number of compacts:	5	5	5	5	5	5	5	5		
Iron										
Deconsolidation-leach (DRF-26A) (μg):	10.71	10.55	10.92	9.76	10.75	10.96	58.59	10.84		
Burn-leach (DRF-26B) (μg):	6.17	24.50	5.11	5.24	5.39	7.11	5.22	5.58		
Total leached (μg):	16.88	35.04	16.03	15.01	16.15	18.07	63.81	16.42		
Fe outside SiC (μg/compact):	**3.38**	**7.01**	**3.21**	**3.00**	**3.23**	**3.61**	**12.76**	**3.28**	**Continued on next page**	
Chromium										
Deconsolidation-leach (DRF-26A) (μg):	1.45	1.14	2.30	1.85	1.33	1.90	1.10	0.71		
Burn-leach (DRF-26B) (μg):	1.26	1.24	1.16	1.15	1.25	1.29	1.18	1.28		
Total leached (μg):	2.71	2.38	3.46	3.00	2.58	3.19	2.27	1.99		
Cr outside SiC (μg/compact):	**0.54**	**0.48**	**0.69**	**0.60**	**0.52**	**0.64**	**0.45**	**0.40**	**Continued on next page**	
Manganese										
Deconsolidation-leach (DRF-26A) (μg):	0.50	0.49	0.51	0.45	0.50	0.51	0.50	0.50		
Burn-leach (DRF-26B) (μg):	0.20	0.20	0.20	0.20	0.19	0.19	0.19	0.20		
Total leached (μg):	0.69	0.69	0.70	0.65	0.69	0.70	0.69	0.70		
Mn outside SiC (μg/compact):	**0.14**	**0.14**	**0.14**	**0.13**	**0.14**	**0.14**	**0.14**	**0.14**	**Continued on next page**	
Cobalt										
Deconsolidation-leach (DRF-26A) (μg):	0.42	0.41	0.43	0.38	0.42	0.43	0.42	0.43		
Burn-leach (DRF-26B) (μg):	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17		
Total leached (μg):	0.59	0.58	0.60	0.55	0.59	0.60	0.58	0.59		
Co outside SiC (μg/compact):	**0.12**	**0.12**	**0.12**	**0.11**	**0.12**	**0.12**	**0.12**	**0.12**	**Continued on next page**	
Nickel										
Deconsolidation-leach (DRF-26A) (μg):	2.08	2.51	2.12	1.98	2.09	2.13	2.47	2.10		
Burn-leach (DRF-26B) (μg):	2.43	4.18	1.18	2.42	2.96	2.51	3.17	3.60		
Total leached (μg):	4.51	6.69	3.30	4.40	5.05	4.64	5.64	5.70		
Ni outside SiC (μg/compact):	**0.90**	**1.34**	**0.66**	**0.88**	**1.01**	**0.93**	**1.13**	**1.14**	**Continued on next page**	
Transition Metals										
Cr+Mn+Co+Ni outside SiC (μg/compact):	**1.70**	**2.07**	**1.61**	**1.72**	**1.78**	**1.82**	**1.84**	**1.80**	**Continued on next page**	
Calcium										
Deconsolidation-leach (DRF-26A) (μg):	26.00	38.52	78.49	54.45	0.00	117.86	5.36	273.96		
Burn-leach (DRF-26B) (μg):	118.60	190.06	108.08	155.96	119.43	98.12	94.92	103.55		
Total leached (μg):	144.60	228.58	186.57	210.41	119.43	215.98	100.28	377.51		
Ca outside SiC (μg/compact):	**28.92**	**45.72**	**37.31**	**42.08**	**23.89**	**43.20**	**20.06**	**75.50**	**Continued on next page**	
Aluminum										
Deconsolidation-leach (DRF-26A) (μg):	67.76	53.78	64.21	71.11	55.71	73.83	55.95	51.47		
Burn-leach (DRF-26B) (μg):	78.80	78.86	78.30	76.42	82.43	90.36	82.05	84.30		
Total leached (μg):	146.56	132.65	142.50	147.53	138.14	164.19	138.01	135.76		
Al outside SiC (μg/compact):	**29.31**	**26.53**	**28.50**	**29.51**	**27.63**	**32.84**	**27.60**	**27.15**	**Continued on next page**	
Titanium										
Deconsolidation-leach (DRF-26A) (μg):	5.58	5.20	11.19	4.78	5.65	6.83	4.02	4.95		
Burn-leach (DRF-26B) (μg):	7.76	8.55	5.06	7.39	8.26	7.49	9.11	9.39		
Total leached (μg):	13.34	13.75	16.25	12.17	13.91	14.32	13.13	14.34		
Ti outside SiC (μg/compact):	**2.67**	**2.75**	**3.25**	**2.43**	**2.78**	**2.86**	**2.63**	**2.87**	**Continued on next page**	
Vanadium										
Deconsolidation-leach (DRF-26A) (μg):	40.04	40.62	40.32	40.09	34.12	32.55	31.85	30.10		
Burn-leach (DRF-26B) (μg):	54.39	61.01	51.42	53.84	58.38	11.67	57.59	58.85		
Total leached (μg):	94.43	101.63	91.73	93.94	92.50	44.22	89.44	88.95		
V outside SiC (μg/compact):	**18.89**	**20.33**	**18.35**	**18.79**	**18.50**	**8.84**	**17.89**	**17.79**	**Continued on next page**	
Titanium and Vanadium										
Ti + V outside SiC (μg/compact):	**21.55**	**23.08**	**21.60**	**21.22**	**21.28**	**11.71**	**20.51**	**20.66**	**Continued on next page**	

Table 7-1: Summary of impurity analysis for LEU09-OP2-Z compacts (continued)

Compact ID numbers:	050, 044, 020, 164, 098	027, 157, 054, 109, 070	025, 106, 133, 110, 029	113, 162, 055, 137, 123	108, 006, 096, 073, 094	166, 111, 099, 042, 120	101, 078, 136, 087, 122	052, 146, 161, 115, 095	Mean	Standard Deviation
Number of compacts:	5	5	5	5	5	5	5	5		
Iron										
Deconsolidation-leach (DRF-26A) (μg):	10.46	10.05	10.46	10.46	9.81	10.26	10.01	10.18		
Burn-leach (DRF-26B) (μg):	5.25	4.83	5.25	5.21	7.09	6.87	4.85	5.14		
Total leached (μg):	15.72	14.88	15.72	15.68	16.89	17.13	14.86	15.32		
Fe outside SiC (μg/compact):	**3.14**	**2.98**	**3.14**	**3.14**	**3.38**	**3.43**	**2.97**	**3.06**	**4.04**	**2.52**
Chromium										
Deconsolidation-leach (DRF-26A) (μg):	1.76	2.10	1.53	1.79	2.77	2.73	2.61	2.74		
Burn-leach (DRF-26B) (μg):	1.18	0.98	1.23	1.09	1.29	1.10	1.09	1.20		
Total leached (μg):	2.95	3.07	2.76	2.88	4.06	3.83	3.70	3.94		
Cr outside SiC (μg/compact):	**0.59**	**0.61**	**0.55**	**0.58**	**0.81**	**0.77**	**0.74**	**0.79**	**0.61**	**0.12**
Manganese										
Deconsolidation-leach (DRF-26A) (μg):	0.49	0.47	0.49	0.49	0.45	0.48	0.46	0.47		
Burn-leach (DRF-26B) (μg):	0.20	0.18	0.19	0.20	0.20	0.19	0.19	0.20		
Total leached (μg):	0.68	0.65	0.68	0.68	0.65	0.67	0.65	0.67		
Mn outside SiC (μg/compact):	**0.14**	**0.13**	**0.14**	**0.14**	**0.13**	**0.13**	**0.13**	**0.13**	**0.136**	**0.004**
Cobalt										
Deconsolidation-leach (DRF-26A) (μg):	0.41	0.40	0.41	0.41	0.39	0.40	0.39	0.40		
Burn-leach (DRF-26B) (μg):	0.17	0.15	0.16	0.17	0.17	0.16	0.16	0.17		
Total leached (μg):	0.58	0.55	0.58	0.58	0.55	0.57	0.55	0.57		
Co outside SiC (μg/compact):	**0.12**	**0.11**	**0.12**	**0.12**	**0.11**	**0.11**	**0.11**	**0.11**	**0.115**	**0.003**
Nickel										
Deconsolidation-leach (DRF-26A) (μg):	2.03	1.95	2.03	2.03	2.56	1.99	1.94	1.98		
Burn-leach (DRF-26B) (μg):	3.12	2.32	2.00	3.07	4.11	1.94	1.83	2.24		
Total leached (μg):	5.15	4.27	4.04	5.10	6.67	3.93	3.78	4.22		
Ni outside SiC (μg/compact):	**1.03**	**0.85**	**0.81**	**1.02**	**1.33**	**0.79**	**0.76**	**0.84**	**0.96**	**0.20**
Transition Metals										
Cr+Mn+Co+Ni outside SiC (μg/compact):	**1.87**	**1.71**	**1.61**	**1.85**	**2.39**	**1.80**	**1.74**	**1.88**	**1.82**	**0.19**
Calcium										
Deconsolidation-leach (DRF-26A) (μg):	88.60	85.37	95.35	31.87	65.37	44.56	93.82	131.76		
Burn-leach (DRF-26B) (μg):	118.79	91.28	107.44	110.55	133.78	132.53	106.42	126.27		
Total leached (μg):	207.39	176.65	202.79	142.41	199.15	177.08	200.25	258.03		
Ca outside SiC (μg/compact):	**41.48**	**35.33**	**40.56**	**28.48**	**39.83**	**35.42**	**40.05**	**51.61**	**39.34**	**12.65**
Aluminum										
Deconsolidation-leach (DRF-26A) (μg):	63.46	69.42	50.61	65.89	96.66	66.76	60.57	70.30		
Burn-leach (DRF-26B) (μg):	79.76	67.14	76.53	78.55	102.16	86.67	91.71	96.17		
Total leached (μg):	143.21	136.56	127.14	144.44	198.81	153.43	152.28	166.47		
Al outside SiC (μg/compact):	**28.64**	**27.31**	**25.43**	**28.89**	**39.76**	**30.69**	**30.46**	**33.29**	**29.60**	**3.44**
Titanium										
Deconsolidation-leach (DRF-26A) (μg):	6.27	7.28	6.69	4.36	8.23	8.10	8.10	8.39		
Burn-leach (DRF-26B) (μg):	7.95	7.03	6.81	8.68	6.56	6.24	7.44	5.86		
Total leached (μg):	14.22	14.30	13.50	13.04	14.79	14.34	15.54	14.25		
Ti outside SiC (μg/compact):	**2.84**	**2.86**	**2.70**	**2.61**	**2.96**	**2.87**	**3.11**	**2.85**	**2.81**	**0.20**
Vanadium										
Deconsolidation-leach (DRF-26A) (μg):	29.70	33.85	27.04	29.20	33.76	34.55	34.68	32.27		
Burn-leach (DRF-26B) (μg):	52.91	46.51	55.06	52.70	53.62	50.93	54.19	49.51		
Total leached (μg):	82.61	80.36	82.10	81.90	87.38	85.47	88.88	81.78		
V outside SiC (μg/compact):	**16.52**	**16.07**	**16.42**	**16.38**	**17.48**	**17.09**	**17.78**	**16.36**	**17.09**	**2.49**
Titanium and Vanadium										
Ti + V outside SiC (μg/compact):	**19.37**	**18.93**	**19.12**	**18.99**	**20.43**	**19.96**	**20.88**	**19.21**	**19.91**	**2.47**

Table 7-2: Summary of uranium contamination and SiC defect analysis for LEU09-OP2-Z compacts

Compact ID numbers	Number of compacts	Effective number of exposed kernels before burn	Number of kernels leached after burn
011, 152, 001, 068, 046	5	0.0	0
067, 081, 019, 008, 032	5	0.0	0
039, 036, 155, 012, 117	5	0.0	0
031, 149, 093, 147, 072	5	0.0	0
051, 086, 143, 097, 033	5	0.0	0
030, 024, 090, 013, 010	5	0.0	0
021, 035, 121, 107, 061	5	0.9	0
151, 003, 058, 080, 009	5	0.0	0
118, 041, 138, 007, 071	5	0.0	Not analyzed
144, 048, 023, 037, 047	5	0.0	Not analyzed
150, 065, 116, 140, 160	5	0.8	Not analyzed
034, 084, 074, 159, 060	5	0.0	Not analyzed
050, 044, 020, 164, 098	5	0.0	0
027, 157, 054, 109, 070	5	0.9	0
025, 106, 133, 110, 029	5	0.0	0
113, 162, 055, 137, 123	5	0.0	0
108, 006, 096, 073, 094	5	0.0	0
166, 111, 099, 042, 120	5	0.0	0
101, 078, 136, 087, 122	5	0.0	0
052, 146, 161, 115, 095	5	0.0	0
Total:	**100**	**3.1**	**0**

After compacts were electrolytically deconsolidated and leached, uranium was detected at a level equivalent to ~3 kernels out of the ~317625 particles leached. This corresponds to a binomial distribution defect fraction of ≤2.5E-5 at 95% confidence, which is above the specified limit of ≤2.0E-5. Analysis of as-coated TRISO particles from the same batch (G73J-14-93073A) showed a similar defect fraction. Further analysis determined that the source of the defects was cracked TRISO coatings on a small fraction of otherwise normal particles. This damage is thought to have occurred at B&W during removal of the particles from the coating furnace via a suction transfer system. Because the suspected root cause of this nonconformance was not related to the compacting and characterization activities at ORNL, a nonconformance report was issued by INL (NCR-44791), with a disposition to "use as is" for the AGR-2 irradiation test.

The measured exposed uranium defect fraction for the 100 compact sample was 3 out of 317,625 particles, which is less than 1E-5. This indicates that the entire compact lot may have a defect fraction below the specified limit. However, it would require a greater number of compacts be analyzed in order to verify this at 95% confidence. Without additional compact analysis, the exposed uranium defect fraction for the entire compact lot can only be determined to be below the 2E-5 specified limit to 85% confidence using binomial distribution statistics. One could also consider the use of a hypergeometric distribution to calculate the exposed uranium defect fraction. The binomial distribution (specified by PIP-12 for acceptance test calculations) is commonly used for coated particle fuel analysis and is more conservative than the hypergeometric distribution. However, when the sample size is a significant fraction of the entire population, which is the case for this analysis, it is more appropriate to apply the hypergeometric

distribution. The hypergeometric distribution would predict a defect fraction of ≤2.1E-5 at 95% confidence, based on the measured sample. Alternately, the hypergeometric distribution would determine the uranium contamination defect fraction to be below the 2E-5 specified limit to 94.4% confidence. Regardless of the chosen calculation method, it is obvious that these compacts are, at worse, only marginally over the specified limit for exposed uranium.

Inspection Report Form IRF-12A: AGR-2 UCO Fuel Compact Lots

Procedure:	AGR-CHAR-PIP-12 Rev. 1
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Compact ID numbers of compacts available for irradiation test (pending acceptance):	002 004 005 014 015 016 017 018 022 026 028 038 040 043 049 053 056 057 059 062 063 066 069 075 077 079 082 083 085 088 089 092 100 102 103 104 105 112 114 119 124 125 126 127 128 129 130 131 132 134 135 139 141 142 153 154 156 158 165 167

Property	Measured Data: Mean (x)	Std. Dev. (s)	Measurements (n)	k or t value	Specification: INL SPC-923 Revison 3	Acceptance Criteria	Acceptance Test Value	Pass or fail	Data Records
Uranium loading (gU/compact)	1.257	0.003	6	2.015	1.265 ± 0.07	A = x - ts/√n ≥ 1.195	1.255	pass	DRF-25
						B = x + ts/√n ≤ 1.335	1.259	pass	
Compact diameter (mm)	See DRF-24				12.22 - 12.46	All available for irradiation test meet specification	See DRF-24	pass	DRF-24
Compact length (mm)					25.02 - 25.40				
Compact matrix density (g/cm^3)					≥1.45			pass	
Iron content outside SiC (µg/compact)	4.04	2.52	16	1.753	mean ≤ 25	B = x + ts/√n ≤ 25	5.1	pass	IRF-12B DRF-26
				3.463	dispersion ≤0.01 ≥ 100	D = x + √3ks < 100	19.2	pass	
Chromium content outside SiC (µg/compact)	0.61	0.12	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	0.7	pass	IRF-12B DRF-26
Manganese content outside SiC (µg/compact)	0.136	0.004	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	0.1	pass	IRF-12B DRF-26
Cobalt content outside SiC (µg/compact)	0.115	0.003	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	0.1	pass	IRF-12B DRF-26
Nickel content outside SiC (µg/compact)	0.96	0.20	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	1.0	pass	IRF-12B DRF-26
Cr + Mn + Co + Ni content outside SiC (µg/compact)	1.82	0.19	16	3.463	dispersion ≤0.01 ≥ 200	D = x + √3ks < 200	3.0	pass	IRF-12B DRF-26
Calcium content outside SiC (µg/compact)	39.34	12.65	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	44.9	pass	IRF-12B DRF-26
Aluminum content outside SiC (µg/compact)	29.60	3.44	16	1.753	mean ≤ 50	B = x + ts/√n ≤ 50	31.1	pass	IRF-12B DRF-26
Ti + V content outside SiC (µg/compact)	19.91	2.47	16	1.753	mean ≤ 240	B = x + ts/√n ≤ 240	21.0	pass	IRF-12B DRF-26

Property	Measured Data: # of compacts	# of particles	Specification: INL SPC-923 Revison 2	Acceptance Criteria	Acceptance Test Value	Pass or fail	Data Records
Uranium contamination fraction (g exposed U/gram U in compact)	100	317625	≤ 2.0 x 10^{-5}	≤1 effectively exposed kernel in ≥237192 particles or ≤2 effectively exposed kernels in ≥314788 particles	3.1	fail	IRF-12C DRF-26
Defective SiC coating fraction (fraction of total particles)	80	254100	≤ 1.0 x 10^{-4}	≤2 leached kernels in ≥62956 particles or ≤6 leached kernels in ≥118422 particles	0	pass	IRF-12D DRF-26
Defective IPyC coating fraction (fraction of total particles)	20	63525	≤ 1.0 x 10^{-4}	≤1 with excessive U dispersion in ≥47437 particles or ≤2 with excessive U dispersion in ≥62956 particles	0	pass	DRF-28
Defective OPyC coating fraction (fraction of total particles)	1	3176	≤ 0.01	≤6 cracked or missing OPyC in ≥1182 particles	0	pass	DRF-27

Comments

A 3/317625 uranium contamination fraction is above the specified limit and corresponds to <2.5e-5 at 95% confidence. This non-conformance was documented on INL NCR-44791 with a disposition of use as is.

QC Supervisor — Date: 2-11-2010

Accept compact lot (Yes or No):	**Yes**

QA Reviewer — Date: 2/11/10

Inspection Report Form IRF-12B: Summary of Impurites Outside SiC - Maximum Corrected Values

Procedure:	AGR-CHAR-PIP-12 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	011, 152, 001, 068, 046	067, 081, 019, 008, 032	039, 036, 155, 012, 117	031, 149, 093, 147, 072	Mean	Standard Deviation
Number of compacts:	5	5	5	5		
Iron						
Deconsolidation-leach (DRF-26A) (µg):	10.71	10.55	10.92	9.76		
Burn-leach (DRF-26B) (µg):	6.17	24.50	5.11	5.24		
Total leached (µg):	16.88	35.04	16.03	15.01		
Fe outside SiC (µg/compact):	**3.38**	**7.01**	**3.21**	**3.00**	**4.15**	**1.91**
Chromium						
Deconsolidation-leach (DRF-26A) (µg):	1.45	1.14	2.30	1.85		
Burn-leach (DRF-26B) (µg):	1.26	1.24	1.16	1.15		
Total leached (µg):	2.71	2.38	3.46	3.00		
Cr outside SiC (µg/compact):	**0.54**	**0.48**	**0.69**	**0.60**	**0.58**	**0.09**
Manganese						
Deconsolidation-leach (DRF-26A) (µg):	0.50	0.49	0.51	0.45		
Burn-leach (DRF-26B) (µg):	0.20	0.20	0.20	0.20		
Total leached (µg):	0.69	0.69	0.70	0.65		
Mn outside SiC (µg/compact):	**0.14**	**0.14**	**0.14**	**0.13**	**0.137**	**0.004**
Cobalt						
Deconsolidation-leach (DRF-26A) (µg):	0.42	0.41	0.43	0.38		
Burn-leach (DRF-26B) (µg):	0.17	0.17	0.17	0.17		
Total leached (µg):	0.59	0.58	0.60	0.55		
Co outside SiC (µg/compact):	**0.12**	**0.12**	**0.12**	**0.11**	**0.116**	**0.004**
Nickel						
Deconsolidation-leach (DRF-26A) (µg):	2.08	2.51	2.12	1.98		
Burn-leach (DRF-26B) (µg):	2.43	4.18	1.18	2.42		
Total leached (µg):	4.51	6.69	3.30	4.40		
Ni outside SiC (µg/compact):	**0.90**	**1.34**	**0.66**	**0.88**	**0.94**	**0.28**
Transition Metals						
Cr+Mn+Co+Ni outside SiC (µg/compact):	**1.70**	**2.07**	**1.61**	**1.72**	**1.77**	**0.20**
Calcium						
Deconsolidation-leach (DRF-26A) (µg):	26.00	38.52	78.49	54.45		
Burn-leach (DRF-26B) (µg):	118.60	190.06	108.08	155.96		
Total leached (µg):	144.60	228.58	186.57	210.41		
Ca outside SiC (µg/compact):	**28.92**	**45.72**	**37.31**	**42.08**	**38.51**	**7.26**
Aluminum						
Deconsolidation-leach (DRF-26A) (µg):	67.76	53.78	64.21	71.11		
Burn-leach (DRF-26B) (µg):	78.80	78.86	78.30	76.42		
Total leached (µg):	146.56	132.65	142.50	147.53		
Al outside SiC (µg/compact):	**29.31**	**26.53**	**28.50**	**29.51**	**28.46**	**1.36**
Titanium						
Deconsolidation-leach (DRF-26A) (µg):	5.58	5.20	11.19	4.78		
Burn-leach (DRF-26B) (µg):	7.76	8.55	5.06	7.39		
Total leached (µg):	13.34	13.75	16.25	12.17		
Ti outside SiC (µg/compact):	**2.67**	**2.75**	**3.25**	**2.43**	**2.78**	**0.34**
Vanadium						
Deconsolidation-leach (DRF-26A) (µg):	40.04	40.62	40.32	40.09		
Burn-leach (DRF-26B) (µg):	54.39	61.01	51.42	53.84		
Total leached (µg):	94.43	101.63	91.73	93.94		
V outside SiC (µg/compact):	**18.89**	**20.33**	**18.35**	**18.79**	**19.09**	**0.86**
Titanium and Vanadium						
Ti + V outside SiC (µg/compact):	**21.55**	**23.08**	**21.60**	**21.22**	**21.86**	**0.83**

QC Supervisor

1-27-10

Date

Inspection Report Form IRF-12B: Summary of Impurites Outside SiC - Maximum Corrected Values

Procedure:	AGR-CHAR-PIP-12 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	051, 086, 143, 097, 033	030, 024, 090, 013, 010	021, 035, 121, 107, 061	151, 003, 058, 080, 009	Mean	Standard Deviation
Number of compacts:	5	5	5	5		
Iron						
Deconsolidation-leach (DRF-26A) (µg):	10.75	10.96	58.59	10.84		
Burn-leach (DRF-26B) (µg):	5.39	7.11	5.22	5.58		
Total leached (µg):	16.15	18.07	63.81	16.42		
Fe outside SiC (µg/compact):	**3.23**	**3.61**	**12.76**	**3.28**	**5.72**	**4.70**
Chromium						
Deconsolidation-leach (DRF-26A) (µg):	1.33	1.90	1.10	0.71		
Burn-leach (DRF-26B) (µg):	1.25	1.29	1.18	1.28		
Total leached (µg):	2.58	3.19	2.27	1.99		
Cr outside SiC (µg/compact):	**0.52**	**0.64**	**0.45**	**0.40**	**0.50**	**0.10**
Manganese						
Deconsolidation-leach (DRF-26A) (µg):	0.50	0.51	0.50	0.50		
Burn-leach (DRF-26B) (µg):	0.19	0.19	0.19	0.20		
Total leached (µg):	0.69	0.70	0.69	0.70		
Mn outside SiC (µg/compact):	**0.14**	**0.14**	**0.14**	**0.14**	**0.139**	**0.001**
Cobalt						
Deconsolidation-leach (DRF-26A) (µg):	0.42	0.43	0.42	0.43		
Burn-leach (DRF-26B) (µg):	0.16	0.16	0.16	0.17		
Total leached (µg):	0.59	0.60	0.58	0.59		
Co outside SiC (µg/compact):	**0.12**	**0.12**	**0.12**	**0.12**	**0.118**	**0.001**
Nickel						
Deconsolidation-leach (DRF-26A) (µg):	2.09	2.13	2.47	2.10		
Burn-leach (DRF-26B) (µg):	2.96	2.51	3.17	3.60		
Total leached (µg):	5.05	4.64	5.64	5.70		
Ni outside SiC (µg/compact):	**1.01**	**0.93**	**1.13**	**1.14**	**1.05**	**0.10**
Transition Metals						
Cr+Mn+Co+Ni outside SiC (µg/compact):	**1.78**	**1.82**	**1.84**	**1.80**	**1.81**	**0.03**
Calcium						
Deconsolidation-leach (DRF-26A) (µg):	0.00	117.86	5.36	273.96		
Burn-leach (DRF-26B) (µg):	119.43	98.12	94.92	103.55		
Total leached (µg):	119.43	215.98	100.28	377.51		
Ca outside SiC (µg/compact):	**23.89**	**43.20**	**20.06**	**75.50**	**40.66**	**25.34**
Aluminum						
Deconsolidation-leach (DRF-26A) (µg):	55.71	73.83	55.95	51.47		
Burn-leach (DRF-26B) (µg):	82.43	90.36	82.05	84.30		
Total leached (µg):	138.14	164.19	138.01	135.76		
Al outside SiC (µg/compact):	**27.63**	**32.84**	**27.60**	**27.15**	**28.80**	**2.70**
Titanium						
Deconsolidation-leach (DRF-26A) (µg):	5.65	6.83	4.02	4.95		
Burn-leach (DRF-26B) (µg):	8.26	7.49	9.11	9.39		
Total leached (µg):	13.91	14.32	13.13	14.34		
Ti outside SiC (µg/compact):	**2.78**	**2.86**	**2.63**	**2.87**	**2.78**	**0.11**
Vanadium						
Deconsolidation-leach (DRF-26A) (µg):	34.12	32.55	31.85	30.10		
Burn-leach (DRF-26B) (µg):	58.38	11.67	57.59	58.85		
Total leached (µg):	92.50	44.22	89.44	88.95		
V outside SiC (µg/compact):	**18.50**	**8.84**	**17.89**	**17.79**	**15.76**	**4.62**
Titanium and Vanadium						
Ti + V outside SiC (µg/compact):	**21.28**	**11.71**	**20.51**	**20.66**	**18.54**	**4.57**

QC Supervisor

1-27-10

Date

Inspection Report Form IRF-12B: Summary of Impurites Outside SiC - Maximum Corrected Values

Procedure:	AGR-CHAR-PIP-12 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	118, 041, 138, 007, 071	144, 048, 023, 037, 047	150, 065, 116, 140, 160	034, 084, 074, 159, 060	Mean	Standard Deviation
Number of compacts:	5	5	5	5		
Iron						
Deconsolidation-leach (DRF-26A) (µg):	9.64	11.12	10.75	10.30		
Burn-leach (DRF-26B) (µg):						
Total leached (µg):						
Fe outside SiC (µg/compact):						
Chromium						
Deconsolidation-leach (DRF-26A) (µg):	1.17	1.77	1.47	1.44		
Burn-leach (DRF-26B) (µg):						
Total leached (µg):						
Cr outside SiC (µg/compact):						
Manganese						
Deconsolidation-leach (DRF-26A) (µg):	0.45	0.48	0.50	0.48		
Burn-leach (DRF-26B) (µg):						
Total leached (µg):						
Mn outside SiC (µg/compact):						
Cobalt						
Deconsolidation-leach (DRF-26A) (µg):	0.38	0.41	0.42	0.41		
Burn-leach (DRF-26B) (µg):						
Total leached (µg):						
Co outside SiC (µg/compact):						
Nickel						
Deconsolidation-leach (DRF-26A) (µg):	1.87	2.02	2.09	2.00		
Burn-leach (DRF-26B) (µg):						
Total leached (µg):						
Ni outside SiC (µg/compact):						
Transition Metals						
Cr+Mn+Co+Ni outside SiC (µg/compact):						
Calcium						
Deconsolidation-leach (DRF-26A) (µg):	113.70	61.40	64.96	186.83		
Burn-leach (DRF-26B) (µg):						
Total leached (µg):						
Ca outside SiC (µg/compact):						
Aluminum						
Deconsolidation-leach (DRF-26A) (µg):	68.32	64.43	70.41	74.53		
Burn-leach (DRF-26B) (µg):						
Total leached (µg):						
Al outside SiC (µg/compact):						
Titanium						
Deconsolidation-leach (DRF-26A) (µg):	7.98	7.13	8.84	10.61		
Burn-leach (DRF-26B) (µg):						
Total leached (µg):						
Ti outside SiC (µg/compact):						
Vanadium						
Deconsolidation-leach (DRF-26A) (µg):	33.42	35.88	35.33	38.32		
Burn-leach (DRF-26B) (µg):						
Total leached (µg):						
V outside SiC (µg/compact):						
Titanium and Vanadium						
Ti + V outside SiC (µg/compact):						

QC Supervisor

1-27-10

Date

Inspection Report Form IRF-12B: Summary of Impurites Outside SiC - Maximum Corrected Values

Procedure:	AGR-CHAR-PIP-12 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	050, 044, 020, 164, 098	027, 157, 054, 109, 070	025, 106, 133, 110, 029	113, 162, 055, 137, 123	Mean	Standard Deviation
Number of compacts:	5	5	5	5		
Iron						
Deconsolidation-leach (DRF-26A) (µg):	10.46	10.05	10.46	10.46		
Burn-leach (DRF-26B) (µg):	5.25	4.83	5.25	5.21		
Total leached (µg):	15.72	14.88	15.72	15.68		
Fe outside SiC (µg/compact):	**3.14**	**2.98**	**3.14**	**3.14**	**3.10**	**0.08**
Chromium						
Deconsolidation-leach (DRF-26A) (µg):	1.76	2.10	1.53	1.79		
Burn-leach (DRF-26B) (µg):	1.18	0.98	1.23	1.09		
Total leached (µg):	2.95	3.07	2.76	2.88		
Cr outside SiC (µg/compact):	**0.59**	**0.61**	**0.55**	**0.58**	**0.58**	**0.03**
Manganese						
Deconsolidation-leach (DRF-26A) (µg):	0.49	0.47	0.49	0.49		
Burn-leach (DRF-26B) (µg):	0.20	0.18	0.19	0.20		
Total leached (µg):	0.68	0.65	0.68	0.68		
Mn outside SiC (µg/compact):	**0.14**	**0.13**	**0.14**	**0.14**	**0.134**	**0.004**
Cobalt						
Deconsolidation-leach (DRF-26A) (µg):	0.41	0.40	0.41	0.41		
Burn-leach (DRF-26B) (µg):	0.17	0.15	0.16	0.17		
Total leached (µg):	0.58	0.55	0.58	0.58		
Co outside SiC (µg/compact):	**0.12**	**0.11**	**0.12**	**0.12**	**0.114**	**0.003**
Nickel						
Deconsolidation-leach (DRF-26A) (µg):	2.03	1.95	2.03	2.03		
Burn-leach (DRF-26B) (µg):	3.12	2.32	2.00	3.07		
Total leached (µg):	5.15	4.27	4.04	5.10		
Ni outside SiC (µg/compact):	**1.03**	**0.85**	**0.81**	**1.02**	**0.93**	**0.11**
Transition Metals						
Cr+Mn+Co+Ni outside SiC (µg/compact):	**1.87**	**1.71**	**1.61**	**1.85**	**1.76**	**0.12**
Calcium						
Deconsolidation-leach (DRF-26A) (µg):	88.60	85.37	95.35	31.87		
Burn-leach (DRF-26B) (µg):	118.79	91.28	107.44	110.55		
Total leached (µg):	207.39	176.65	202.79	142.41		
Ca outside SiC (µg/compact):	**41.48**	**35.33**	**40.56**	**28.48**	**36.46**	**5.97**
Aluminum						
Deconsolidation-leach (DRF-26A) (µg):	63.46	69.42	50.61	65.89		
Burn-leach (DRF-26B) (µg):	79.76	67.14	76.53	78.55		
Total leached (µg):	143.21	136.56	127.14	144.44		
Al outside SiC (µg/compact):	**28.64**	**27.31**	**25.43**	**28.89**	**27.57**	**1.59**
Titanium						
Deconsolidation-leach (DRF-26A) (µg):	6.27	7.28	6.69	4.36		
Burn-leach (DRF-26B) (µg):	7.95	7.03	6.81	8.68		
Total leached (µg):	14.22	14.30	13.50	13.04		
Ti outside SiC (µg/compact):	**2.84**	**2.86**	**2.70**	**2.61**	**2.75**	**0.12**
Vanadium						
Deconsolidation-leach (DRF-26A) (µg):	29.70	33.85	27.04	29.20		
Burn-leach (DRF-26B) (µg):	52.91	46.51	55.06	52.70		
Total leached (µg):	82.61	80.36	82.10	81.90		
V outside SiC (µg/compact):	**16.52**	**16.07**	**16.42**	**16.38**	**16.35**	**0.19**
Titanium and Vanadium						
Ti + V outside SiC (µg/compact):	**19.37**	**18.93**	**19.12**	**18.99**	**19.10**	**0.19**

QC Supervisor

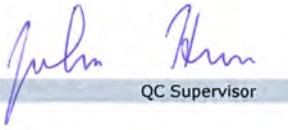
1-27-10

Date

Inspection Report Form IRF-12B: Summary of Impurites Outside SiC - Maximum Corrected Values

Procedure:	AGR-CHAR-PIP-12 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	108, 006, 096, 073, 094	166, 111, 099, 042, 120	101, 078, 136, 087, 122	052, 146, 161, 115, 095	Mean	Standard Deviation
Number of compacts:	5	5	5	5		
Iron						
Deconsolidation-leach (DRF-26A) (µg):	9.81	10.26	10.01	10.18		
Burn-leach (DRF-26B) (µg):	7.09	6.87	4.85	5.14		
Total leached (µg):	16.89	17.13	14.86	15.32		
Fe outside SiC (µg/compact):	**3.38**	**3.43**	**2.97**	**3.06**	**3.21**	**0.23**
Chromium						
Deconsolidation-leach (DRF-26A) (µg):	2.77	2.73	2.61	2.74		
Burn-leach (DRF-26B) (µg):	1.29	1.10	1.09	1.20		
Total leached (µg):	4.06	3.83	3.70	3.94		
Cr outside SiC (µg/compact):	**0.81**	**0.77**	**0.74**	**0.79**	**0.78**	**0.03**
Manganese						
Deconsolidation-leach (DRF-26A) (µg):	0.45	0.48	0.46	0.47		
Burn-leach (DRF-26B) (µg):	0.20	0.19	0.19	0.20		
Total leached (µg):	0.65	0.67	0.65	0.67		
Mn outside SiC (µg/compact):	**0.13**	**0.13**	**0.13**	**0.13**	**0.132**	**0.002**
Cobalt						
Deconsolidation-leach (DRF-26A) (µg):	0.39	0.40	0.39	0.40		
Burn-leach (DRF-26B) (µg):	0.17	0.16	0.16	0.17		
Total leached (µg):	0.55	0.57	0.55	0.57		
Co outside SiC (µg/compact):	**0.11**	**0.11**	**0.11**	**0.11**	**0.112**	**0.002**
Nickel						
Deconsolidation-leach (DRF-26A) (µg):	2.56	1.99	1.94	1.98		
Burn-leach (DRF-26B) (µg):	4.11	1.94	1.83	2.24		
Total leached (µg):	6.67	3.93	3.78	4.22		
Ni outside SiC (µg/compact):	**1.33**	**0.79**	**0.76**	**0.84**	**0.93**	**0.27**
Transition Metals						
Cr+Mn+Co+Ni outside SiC (µg/compact):	**2.39**	**1.80**	**1.74**	**1.88**	**1.95**	**0.30**
Calcium						
Deconsolidation-leach (DRF-26A) (µg):	65.37	44.56	93.82	131.76		
Burn-leach (DRF-26B) (µg):	133.78	132.53	106.42	126.27		
Total leached (µg):	199.15	177.08	200.25	258.03		
Ca outside SiC (µg/compact):	**39.83**	**35.42**	**40.05**	**51.61**	**41.73**	**6.92**
Aluminum						
Deconsolidation-leach (DRF-26A) (µg):	96.66	66.76	60.57	70.30		
Burn-leach (DRF-26B) (µg):	102.16	86.67	91.71	96.17		
Total leached (µg):	198.81	153.43	152.28	166.47		
Al outside SiC (µg/compact):	**39.76**	**30.69**	**30.46**	**33.29**	**33.55**	**4.34**
Titanium						
Deconsolidation-leach (DRF-26A) (µg):	8.23	8.10	8.10	8.39		
Burn-leach (DRF-26B) (µg):	6.56	6.24	7.44	5.86		
Total leached (µg):	14.79	14.34	15.54	14.25		
Ti outside SiC (µg/compact):	**2.96**	**2.87**	**3.11**	**2.85**	**2.95**	**0.12**
Vanadium						
Deconsolidation-leach (DRF-26A) (µg):	33.76	34.55	34.68	32.27		
Burn-leach (DRF-26B) (µg):	53.62	50.93	54.19	49.51		
Total leached (µg):	87.38	85.47	88.88	81.78		
V outside SiC (µg/compact):	**17.48**	**17.09**	**17.78**	**16.36**	**17.18**	**0.61**
Titanium and Vanadium						
Ti + V outside SiC (µg/compact):	**20.43**	**19.96**	**20.88**	**19.21**	**20.12**	**0.72**



QC Supervisor

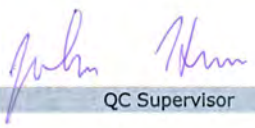
2-11-2010

Date

Inspection Report Form IRF-12C: Summary of Uranium Contamination

Procedure:	AGR-CHAR-PIP-12 Rev. 0
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	011, 152, 001, 068, 046	067, 081, 019, 008, 032	039, 036, 155, 012, 117	031, 149, 093, 147, 072	Total
Number of compacts:	5	5	5	5	20
Effective number of exposed kernels:	0.0	0.0	0.0	0.0	0.1



QC Supervisor

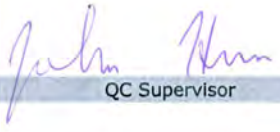
1-27-10

Date

Inspection Report Form IRF-12C: Summary of Uranium Contamination

Procedure:	AGR-CHAR-PIP-12 Rev. 0
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	051, 086, 143, 097, 033	030, 024, 090, 013, 010	021, 035, 121, 107, 061	151, 003, 058, 080, 009	Total
Number of compacts:	5	5	5	5	20
Effective number of exposed kernels:	0.0	0.0	0.9	0.0	1.0



QC Supervisor

1-27-10

Date

Inspection Report Form IRF-12C: Summary of Uranium Contamination

Procedure:	AGR-CHAR-PIP-12 Rev. 0
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	118, 041, 138, 007, 071	144, 048, 023, 037, 047	150, 065, 116, 140, 160	034, 084, 074, 159, 060	Total
Number of compacts:	5	5	5	5	20
Effective number of exposed kernels:	0.0	0.0	0.8	0.0	0.9

John Klumm — QC Supervisor

1-27-10 — Date

Inspection Report Form IRF-12C: Summary of Uranium Contamination

Procedure:	AGR-CHAR-PIP-12 Rev. 0
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	050, 044, 020, 164, 098	027, 157, 054, 109, 070	025, 106, 133, 110, 029	113, 162, 055, 137, 123	Total
Number of compacts:	5	5	5	5	20
Effective number of exposed kernels:	0.0	0.9	0.0	0.0	1.0

QC Supervisor

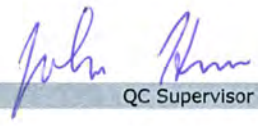
1-27-10

Date

Inspection Report Form IRF-12C: Summary of Uranium Contamination

Procedure:	AGR-CHAR-PIP-12 Rev. 0
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	108, 006, 096, 073, 094	166, 111, 099, 042, 120	101, 078, 136, 087, 122	052, 146, 161, 115, 095	Total
Number of compacts:	5	5	5	5	20
Effective number of exposed kernels:	0.0	0.0	0.0	0.0	0.1



QC Supervisor

2-11-2010

Date

Inspection Report Form IRF-12D: Summary of Burn Leach Defects

Procedure:	AGR-CHAR-PIP-12 Rev. 0
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	011, 152, 001, 068, 046	067, 081, 019, 008, 032	039, 036, 155, 012, 117	031, 149, 093, 147, 072	Total
Number of compacts:	5	5	5	5	20
Number of leached kernels:	0	0	0	0	0

QC Supervisor

1-27-10

Date

Inspection Report Form IRF-12D: Summary of Burn Leach Defects

Procedure:	AGR-CHAR-PIP-12 Rev. 0
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	051, 086, 143, 097, 033	030, 024, 090, 013, 010	021, 035, 121, 107, 061	151, 003, 058, 080, 009	Total
Number of compacts:	5	5	5	5	20
Number of leached kernels:	0	0	0	0	0

QC Supervisor

1-27-10

Date

Inspection Report Form IRF-12D: Summary of Burn Leach Defects

Procedure:	AGR-CHAR-PIP-12 Rev. 0
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	050, 044, 020, 164, 098	027, 157, 054, 109, 070	025, 106, 133, 110, 029	113, 162, 055, 137, 123	Total
Number of compacts:	5	5	5	5	20
Number of leached kernels:	0	0	0	0	0

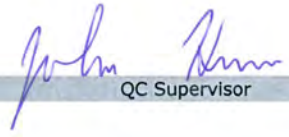
John Thurm — QC Supervisor

1-27-10 — Date

Inspection Report Form IRF-12D: Summary of Burn Leach Defects

Procedure:	AGR-CHAR-PIP-12 Rev. 0
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact Lot description:	AGR-2 UCO Variant, from G73J-14-93073A

Compact ID numbers:	108, 006, 096, 073, 094	166, 111, 099, 042, 120	101, 078, 136, 087, 122	052, 146, 161, 115, 095	Total
Number of compacts:	5	5	5	5	20
Number of leached kernels:	0	0	0	0	0



QC Supervisor

2-11-2010

Date

Data Report Form DRF-24A: Compact Diameter and Length

Procedure:	AGR-CHAR-DAM-24 Rev. 6a
Operator:	Hunn/Barker/Dunbar
Compact lot ID:	LEU09-OP2
Compact Lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\CompactDimensions\LEU09-OP2_DRF24R6a.xls

Vertical height gauge calibration due date:	3/6/10
Pass-thru block calibration due date:	1/17/11
Digital caliper calibration due date:	7/7/10
Gauge blocks calibration due date:	11/7/12
Analytical balance calibration due date:	2/12/10 & 10/29/09

Acceptance criteria for compact length:	≥25.02 and ≤25.40 mm
Acceptance criteria for compact diameter:	≥12.22 and ≤12.46 mm (and pass through 12.46 mm ring gauge)
Acceptance criteria for compact mass:	For information only

Compact ID Number	Length (mm)	Diameter (mm)						Pass Thru? (Y or N)	Compact weight (g)	Accept? (pass or fail)
		Top 1	Top 2	Middle 1	Middle 2	Bottom 1	Bottom 2			
Z001	25.112	12.29	12.29	12.30	12.30	12.30	12.30	Y	6.2884	pass
Z002	25.165	12.30	12.30	12.30	12.30	12.30	12.29	Y	6.2801	pass
Z003	25.128	12.30	12.29	12.30	12.30	12.30	12.29	Y	6.2926	pass
Z004	25.163	12.29	12.29	12.30	12.30	12.29	12.29	Y	6.2962	pass
Z005	25.144	12.29	12.30	12.30	12.30	12.30	12.30	Y	6.2944	pass
Z006	25.158	12.30	12.29	12.30	12.30	12.30	12.29	Y	6.2859	pass
Z007	25.140	12.29	12.29	12.30	12.30	12.30	12.30	Y	6.2972	pass
Z008	25.140	12.30	12.30	12.31	12.30	12.30	12.30	Y	6.2906	pass
Z009	25.148	12.30	12.30	12.30	12.30	12.29	12.29	Y	6.2843	pass
Z010	25.145	12.31	12.30	12.31	12.31	12.28	12.27	Y	6.2954	pass
Z011	25.111	12.28	12.27	12.28	12.29	12.27	12.27	Y	6.2927	pass
Z012	25.195	12.29	12.28	12.30	12.29	12.29	12.28	Y	6.3256	pass
Z013	25.135	12.29	12.29	12.29	12.29	12.28	12.28	Y	6.2937	pass
Z014	25.114	12.28	12.27	12.29	12.29	12.29	12.28	Y	6.2818	pass
Z015	25.133	12.27	12.28	12.29	12.29	12.28	12.28	Y	6.2821	pass
Z016	25.123	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2895	pass
Z017	25.143	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2825	pass
Z018	25.166	12.28	12.28	12.30	12.29	12.29	12.28	Y	6.2944	pass
Z019	25.206	12.29	12.29	12.30	12.30	12.29	12.29	Y	6.3703	pass
Z020	25.179	12.29	12.29	12.29	12.30	12.29	12.29	Y	6.3122	pass
Z021	25.174	12.29	12.29	12.29	12.29	12.29	12.29	Y	6.3196	pass
Z022	25.137	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2945	pass
Z023	25.208	12.29	12.29	12.30	12.30	12.29	12.29	Y	6.3142	pass
Z024	25.140	12.28	12.29	12.29	12.29	12.29	12.28	Y	6.2978	pass
Z025	25.124	12.29	12.28	12.29	12.29	12.28	12.28	Y	6.2831	pass
Z026	25.132	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2969	pass
Z027	25.177	12.29	12.29	12.30	12.30	12.29	12.29	Y	6.3065	pass
Z028	25.135	12.28	12.27	12.29	12.29	12.29	12.28	Y	6.2847	pass
Z029	25.146	12.29	12.28	12.30	12.30	12.29	12.29	Y	6.2950	pass
Z030	25.135	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2958	pass
Z031	25.153	12.29	12.28	12.30	12.29	12.29	12.28	Y	6.2932	pass
Z032	25.132	12.28	12.28	12.29	12.29	12.28	12.29	Y	6.2865	pass
Z033	25.139	12.29	12.29	12.29	12.29	12.29	12.29	Y	6.3031	pass
Z034	25.156	12.28	12.28	12.29	12.29	12.29	12.29	Y	6.2925	pass
Z035	25.116	12.29	12.28	12.28	12.29	12.28	12.28	Y	6.2888	pass
Z036	25.130	12.29	12.28	12.29	12.29	12.29	12.29	Y	6.3030	pass
Z037	25.126	12.28	12.29	12.29	12.29	12.29	12.29	Y	6.2938	pass
Z038	25.182	12.29	12.29	12.31	12.30	12.29	12.29	Y	6.2924	pass
Z039	25.184	12.28	12.28	12.29	12.30	12.28	12.28	Y	6.3034	pass
Z040	25.130	12.28	12.28	12.29	12.30	12.29	12.28	Y	6.2865	pass
Z041	25.139	12.28	12.28	12.29	12.29	12.29	12.28	Y	6.3100	pass
Z042	25.153	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2984	pass
Z043	25.135	12.29	12.29	12.29	12.29	12.29	12.29	Y	6.3041	pass
Z044	25.153	12.29	12.29	12.30	12.29	12.29	12.29	Y	6.3066	pass
Z045	25.184	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2984	pass
Z046	25.195	12.30	12.30	12.31	12.31	12.30	12.30	Y	6.3090	pass
Z047	25.133	12.28	12.28	12.29	12.29	12.29	12.29	Y	6.2930	pass
Z048	25.118	12.28	12.28	12.29	12.30	12.29	12.29	Y	6.2979	pass
Z049	25.133	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2787	pass
Z050	25.147	12.28	12.28	12.29	12.28	12.29	12.28	Y	6.2935	pass

Comments

Operator — 7-17-09 Date

QC Supervisor — 1-11-10 Date

QA Reviewer — 2/03/10 Date

Data Report Form DRF-24A: Compact Diameter and Length

Procedure:	AGR-CHAR-DAM-24 Rev. 6a
Operator:	Hunn/Barker/Dunbar
Compact lot ID:	LEU09-OP2
Compact Lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\CompactDimensions\LEU09-OP2_DRF24R6a.xls

Vertical height gauge calibration due date:	3/6/10
Pass-thru block calibration due date:	1/17/11
Digital caliper calibration due date:	7/7/10
Gauge blocks calibration due date:	11/7/12
Analytical balance calibration due date:	2/12/10 & 10/29/09

Acceptance criteria for compact length:	≥25.02 and ≤25.40 mm
Acceptance criteria for compact diameter:	≥12.22 and ≤12.46 mm (and pass through 12.46 mm ring gauge)
Acceptance criteria for compact mass:	For information only

Compact ID Number	Length (mm)	Diameter (mm)						Pass Thru? (Y or N)	Compact weight (g)	Accept? (pass or fail)
		Top 1	Top 2	Middle 1	Middle 2	Bottom 1	Bottom 2			
Z051	25.111	12.29	12.28	12.29	12.30	12.29	12.28	Y	6.3002	pass
Z052	25.171	12.29	12.29	12.30	12.30	12.29	12.29	Y	6.3182	pass
Z053	25.109	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2827	pass
Z054	25.146	12.28	12.29	12.29	12.29	12.29	12.29	Y	6.3061	pass
Z055	25.140	12.29	12.28	12.29	12.29	12.29	12.28	Y	6.2937	pass
Z056	25.137	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.3073	pass
Z057	25.179	12.29	12.29	12.30	12.30	12.29	12.29	Y	6.2933	pass
Z058	25.128	12.28	12.29	12.29	12.29	12.28	12.28	Y	6.2825	pass
Z059	25.146	12.28	12.28	12.29	12.29	12.29	12.28	Y	6.2939	pass
Z060	25.158	12.29	12.28	12.29	12.30	12.28	12.28	Y	6.2949	pass
Z061	25.161	12.29	12.29	12.30	12.29	12.29	12.28	Y	6.2958	pass
Z062	25.146	12.28	12.29	12.29	12.30	12.28	12.28	Y	6.2811	pass
Z063	25.135	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2910	pass
Z064	25.142	12.28	12.29	12.29	12.29	12.29	12.29	Y	6.3014	pass
Z065	25.134	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2900	pass
Z066	25.132	12.29	12.29	12.29	12.30	12.29	12.28	Y	6.2968	pass
Z067	25.154	12.29	12.29	12.30	12.30	12.28	12.28	Y	6.2931	pass
Z068	25.156	12.29	12.29	12.30	12.30	12.29	12.28	Y	6.3137	pass
Z069	25.187	12.29	12.29	12.30	12.30	12.29	12.29	Y	6.3230	pass
Z070	25.135	12.28	12.28	12.30	12.29	12.28	12.28	Y	6.2840	pass
Z071	25.139	12.28	12.27	12.29	12.29	12.28	12.28	Y	6.3029	pass
Z072	25.149	12.28	12.28	12.29	12.29	12.29	12.29	Y	6.3009	pass
Z073	25.134	12.28	12.28	12.29	12.29	12.29	12.30	Y	6.2941	pass
Z074	25.151	12.28	12.29	12.29	12.29	12.28	12.28	Y	6.3016	pass
Z075	25.154	12.28	12.28	12.30	12.30	12.29	12.29	Y	6.3041	pass
Z076	25.154	12.30	12.29	12.30	12.30	12.29	12.29	Y	6.3005	pass
Z077	25.130	12.28	12.28	12.29	12.29	12.29	12.28	Y	6.2961	pass
Z078	25.153	12.29	12.28	12.30	12.30	12.29	12.29	Y	6.2966	pass
Z079	25.142	12.29	12.29	12.30	12.29	12.29	12.28	Y	6.3000	pass
Z080	25.146	12.29	12.28	12.29	12.29	12.29	12.29	Y	6.2773	pass
Z081	25.149	12.29	12.29	12.29	12.30	12.28	12.28	Y	6.3018	pass
Z082	25.140	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2970	pass
Z083	25.144	12.28	12.29	12.30	12.30	12.28	12.28	Y	6.3064	pass
Z084	25.145	12.29	12.29	12.29	12.29	12.28	12.28	Y	6.2906	pass
Z085	25.149	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2757	pass
Z086	25.167	12.29	12.29	12.30	12.29	12.28	12.29	Y	6.3034	pass
Z087	25.134	12.29	12.28	12.29	12.29	12.29	12.28	Y	6.2944	pass
Z088	25.142	12.28	12.28	12.30	12.30	12.29	12.29	Y	6.3006	pass
Z089	25.172	12.29	12.29	12.30	12.31	12.29	12.29	Y	6.3115	pass
Z090	25.142	12.29	12.29	12.30	12.29	12.28	12.28	Y	6.2800	pass
Z091	25.125	12.29	12.28	12.29	12.30	12.28	12.28	Y	6.2869	pass
Z092	25.151	12.29	12.29	12.29	12.30	12.29	12.28	Y	6.3015	pass
Z093	25.133	12.28	12.28	12.29	12.29	12.29	12.29	Y	6.2954	pass
Z094	25.134	12.28	12.28	12.29	12.30	12.28	12.28	Y	6.2980	pass
Z095	25.133	12.28	12.28	12.28	12.28	12.27	12.27	Y	6.2926	pass
Z096	25.187	12.29	12.30	12.30	12.30	12.30	12.30	Y	6.3214	pass
Z097	25.128	12.29	12.29	12.30	12.30	12.29	12.29	Y	6.3053	pass
Z098	25.135	12.29	12.29	12.29	12.29	12.29	12.29	Y	6.2893	pass
Z099	25.063	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2882	pass
Z100	25.146	12.28	12.28	12.30	12.29	12.28	12.29	Y	6.2957	pass

Comments

Operator

7-17-09

Date

QC Supervisor

1-11-10

Date

QA Reviewer

2/03/10

Date

Data Report Form DRF-24A: Compact Diameter and Length

Procedure:	AGR-CHAR-DAM-24 Rev. 6a
Operator:	Hunn/Barker/Dunbar
Compact lot ID:	LEU09-OP2
Compact Lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\CompactDimensions\LEU09-OP2_DRF24R6a.xls

Vertical height gauge calibration due date:	3/6/10
Pass-thru block calibration due date:	1/17/11
Digital caliper calibration due date:	7/7/10
Gauge blocks calibration due date:	11/7/12
Analytical balance calibration due date:	2/12/10 & 10/29/09

Acceptance criteria for compact length:	≥25.02 and ≤25.40 mm
Acceptance criteria for compact diameter:	≥12.22 and ≤12.46 mm (and pass through 12.46 mm ring gauge)
Acceptance criteria for compact mass:	For information only

Compact ID Number	Length (mm)	Diameter (mm)						Pass Thru? (Y or N)	Compact weight (g)	Accept? (pass or fail)
		Top 1	Top 2	Middle 1	Middle 2	Bottom 1	Bottom 2			
Z101	25.129	12.29	12.29	12.30	12.30	12.29	12.28	Y	6.3040	pass
Z102	25.125	12.28	12.28	12.30	12.30	12.29	12.28	Y	6.2944	pass
Z103	25.149	12.28	12.29	12.28	12.28	12.28	12.28	Y	6.2859	pass
Z104	25.153	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.3137	pass
Z105	25.115	12.29	12.29	12.30	12.30	12.28	12.28	Y	6.2989	pass
Z106	25.120	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2897	pass
Z107	25.151	12.29	12.29	12.29	12.29	12.29	12.28	Y	6.2884	pass
Z108	25.024	12.28	12.27	12.28	12.29	12.27	12.28	Y	6.2840	pass
Z109	25.152	12.29	12.29	12.29	12.29	12.28	12.28	Y	6.2941	pass
Z110	25.151	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2837	pass
Z111	25.152	12.29	12.28	12.29	12.29	12.28	12.28	Y	6.2904	pass
Z112	25.134	12.29	12.29	12.29	12.29	12.28	12.28	Y	6.2922	pass
Z113	25.114	12.28	12.28	12.29	12.29	12.28	12.29	Y	6.2861	pass
Z114	25.130	12.28	12.28	12.29	12.29	12.29	12.29	Y	6.2934	pass
Z115	25.132	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2832	pass
Z116	25.142	12.29	12.28	12.29	12.29	12.28	12.29	Y	6.2870	pass
Z117	25.148	12.29	12.29	12.29	12.29	12.28	12.29	Y	6.3025	pass
Z118	25.151	12.28	12.28	12.29	12.30	12.28	12.28	Y	6.2928	pass
Z119	25.158	12.28	12.28	12.30	12.30	12.29	12.29	Y	6.2985	pass
Z120	25.120	12.29	12.29	12.30	12.30	12.28	12.29	Y	6.3053	pass
Z121	25.135	12.29	12.28	12.29	12.29	12.29	12.28	Y	6.2959	pass
Z122	25.130	12.28	12.28	12.30	12.29	12.28	12.28	Y	6.2843	pass
Z123	25.151	12.28	12.28	12.29	12.29	12.29	12.29	Y	6.2986	pass
Z124	25.130	12.29	12.29	12.29	12.29	12.28	12.28	Y	6.2830	pass
Z125	25.139	12.29	12.28	12.29	12.30	12.28	12.29	Y	6.3026	pass
Z126	25.134	12.28	12.28	12.30	12.30	12.28	12.29	Y	6.2944	pass
Z127	25.142	12.28	12.28	12.29	12.30	12.28	12.28	Y	6.2828	pass
Z128	25.140	12.28	12.28	12.29	12.29	12.28	12.29	Y	6.2886	pass
Z129	25.139	12.28	12.28	12.30	12.30	12.29	12.29	Y	6.2837	pass
Z130	25.132	12.29	12.29	12.30	12.30	12.29	12.29	Y	6.2855	pass
Z131	25.142	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2804	pass
Z132	25.217	12.28	12.28	12.30	12.29	12.27	12.28	Y	6.3422	pass
Z133	25.133	12.29	12.28	12.29	12.29	12.29	12.28	Y	6.2959	pass
Z134	25.147	12.29	12.29	12.30	12.30	12.29	12.28	Y	6.2983	pass
Z135	25.133	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2972	pass
Z136	25.140	12.29	12.28	12.29	12.29	12.28	12.29	Y	6.2922	pass
Z137	25.144	12.29	12.28	12.29	12.30	12.28	12.28	Y	6.2877	pass
Z138	25.177	12.29	12.29	12.30	12.30	12.29	12.28	Y	6.3043	pass
Z139	25.112	12.28	12.27	12.29	12.29	12.28	12.28	Y	6.2862	pass
Z140	25.161	12.28	12.28	12.29	12.29	12.29	12.29	Y	6.2964	pass
Z141	25.132	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2819	pass
Z142	25.114	12.28	12.28	12.29	12.30	12.28	12.28	Y	6.2926	pass
Z143	25.148	12.29	12.29	12.29	12.28	12.28	12.28	Y	6.2894	pass
Z144	25.156	12.28	12.28	12.29	12.29	12.28	12.27	Y	6.2958	pass
Z145	25.134	12.28	12.29	12.29	12.29	12.28	12.28	Y	6.2905	pass
Z146	25.163	12.29	12.28	12.30	12.29	12.28	12.29	Y	6.3008	pass
Z147	25.158	12.29	12.29	12.30	12.30	12.28	12.28	Y	6.3024	pass
Z148	25.142	12.28	12.28	12.29	12.30	12.28	12.29	Y	6.2992	pass
Z149	25.115	12.28	12.28	12.29	12.30	12.28	12.28	Y	6.2842	pass
Z150	25.148	12.29	12.28	12.30	12.30	12.29	12.28	Y	6.2950	pass

Comments

Operator — 7-17-09 Date

QC Supervisor — 1-11-10 Date

QA Reviewer — 2/03/10 Date

Data Report Form DRF-24A: Compact Diameter and Length

Procedure:	AGR-CHAR-DAM-24 Rev. 6a
Operator:	Hunn/Barker/Dunbar
Compact lot ID:	LEU09-OP2
Compact Lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\CompactDimensions\LEU09-OP2_DRF24R6a.xls

Vertical height gauge calibration due date:	3/6/10
Pass-thru block calibration due date:	1/17/11
Digital caliper calibration due date:	7/7/10
Gauge blocks calibration due date:	11/7/12
Analytical balance calibration due date:	2/12/10 & 10/29/09

Acceptance criteria for compact length:	≥25.02 and ≤25.40 mm
Acceptance criteria for compact diameter:	≥12.22 and ≤12.46 mm (and pass through 12.46 mm ring gauge)
Acceptance criteria for compact mass:	For information only

Compact ID Number	Length (mm)	Diameter (mm)						Pass Thru? (Y or N)	Compact weight (g)	Accept? (pass or fail)
		Top 1	Top 2	Middle 1	Middle 2	Bottom 1	Bottom 2			
Z151	25.156	12.29	12.28	12.29	12.29	12.28	12.28	Y	6.2941	pass
Z152	25.140	12.28	12.28	12.30	12.30	12.28	12.29	Y	6.3043	pass
Z153	25.173	12.28	12.28	12.29	12.29	12.29	12.29	Y	6.2956	pass
Z154	25.146	12.29	12.28	12.29	12.29	12.28	12.28	Y	6.2861	pass
Z155	25.125	12.29	12.29	12.29	12.29	12.29	12.29	Y	6.2828	pass
Z156	25.156	12.29	12.29	12.29	12.29	12.29	12.28	Y	6.3057	pass
Z157	25.152	12.28	12.28	12.30	12.29	12.29	12.29	Y	6.3038	pass
Z158	25.133	12.28	12.28	12.29	12.28	12.28	12.28	Y	6.2780	pass
Z159	25.132	12.28	12.28	12.29	12.29	12.28	12.29	Y	6.3027	pass
Z160	25.060	12.28	12.28	12.29	12.29	12.28	12.28	Y	6.2813	pass
Z161	25.140	12.28	12.28	12.29	12.29	12.29	12.28	Y	6.2758	pass
Z162	25.125	12.28	12.28	12.29	12.29	12.28	12.29	Y	6.2839	pass
Z163	25.142	12.28	12.28	12.29	12.29	12.28	12.29	Y	6.2985	pass
Z164	25.048	12.28	12.28	12.30	12.30	12.28	12.28	Y	6.2829	pass
Z165	25.116	12.28	12.28	12.28	12.28	12.28	12.28	Y	6.2897	pass
Z166	25.161	12.29	12.29	12.30	12.30	12.28	12.28	Y	6.2864	pass
Z167	25.168	12.29	12.28	12.29	12.29	12.28	12.28	Y	6.2828	pass
Z168										
Z169										
Z170										
Z171										
Z172										
Z173										
Z174										
Z175										
Z176										
Z177										
Z178										
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Z193										
Z194										
Z195										
Z196										
Z197										
Z198										
Z199										
Z200										

Comments

Operator — 7-17-09 — Date

QC Supervisor — 1-11-10 — Date

QA Reviewer — 2/03/10 — Date

Data Report Form DRF-24B: Compact Matrix Density

Procedure:	AGR-CHAR-DAM-24 Rev. 6a
Operator:	Hunn/Barker/Dunbar
Compact lot ID:	LEU09-OP2
Compact Lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\CompactDimensions\LEU09-OP2_DRF24R6a.xls

Average weight per TRISO particle (g):	1.032E-03
Average weight per overcoated particle (g):	2.010E-03
Average TRISO particle volume (cm3):	3.430E-04

Acceptance criteria for matrix density:	≥1.45

Compact ID Number	Compact Weight (g)	Length (mm)	Av. Diameter (mm)	Compact Volume (cm3)	Charge Weight (g)	Particle Weight (g)	Particle Volume (cm3)	Packing Fraction	Matrix Density (g/cm3)	Accept? (pass or fail)
Z001	6.2884	25.112	12.30	2.98	6.4327	3.3024	1.10	37%	1.58	pass
Z002	6.2801	25.165	12.30	2.99	6.4306	3.3014	1.10	37%	1.57	pass
Z003	6.2926	25.128	12.30	2.98	6.4303	3.3014	1.10	37%	1.59	pass
Z004	6.2962	25.163	12.29	2.99	6.4318	3.3024	1.10	37%	1.58	pass
Z005	6.2944	25.144	12.30	2.99	6.4309	3.3014	1.10	37%	1.58	pass
Z006	6.2859	25.158	12.30	2.99	6.4313	3.3024	1.10	37%	1.58	pass
Z007	6.2972	25.140	12.30	2.99	6.4311	3.3024	1.10	37%	1.59	pass
Z008	6.2906	25.140	12.30	2.99	6.4318	3.3024	1.10	37%	1.58	pass
Z009	6.2843	25.148	12.30	2.99	6.4326	3.3024	1.10	37%	1.58	pass
Z010	6.2954	25.145	12.30	2.99	6.4322	3.3024	1.10	37%	1.58	pass
Z011	6.2927	25.111	12.28	2.97	6.4307	3.3014	1.10	37%	1.60	pass
Z012	6.3256	25.195	12.29	2.99	6.4329	3.3024	1.10	37%	1.60	pass
Z013	6.2937	25.135	12.29	2.98	6.4313	3.3024	1.10	37%	1.59	pass
Z014	6.2818	25.114	12.28	2.98	6.4311	3.3024	1.10	37%	1.59	pass
Z015	6.2821	25.133	12.28	2.98	6.4325	3.3024	1.10	37%	1.59	pass
Z016	6.2895	25.123	12.28	2.98	6.4315	3.3024	1.10	37%	1.59	pass
Z017	6.2825	25.143	12.28	2.98	6.4322	3.3024	1.10	37%	1.58	pass
Z018	6.2944	25.166	12.29	2.98	6.4329	3.3024	1.10	37%	1.59	pass
Z019	6.3703	25.206	12.29	2.99	6.4325	3.3024	1.10	37%	1.62	pass
Z020	6.3122	25.179	12.29	2.99	6.4312	3.3024	1.10	37%	1.59	pass
Z021	6.3196	25.174	12.29	2.99	6.4323	3.3024	1.10	37%	1.60	pass
Z022	6.2945	25.137	12.28	2.98	6.4311	3.3024	1.10	37%	1.59	pass
Z023	6.3142	25.208	12.29	2.99	6.4314	3.3024	1.10	37%	1.59	pass
Z024	6.2978	25.140	12.29	2.98	6.4302	3.3014	1.10	37%	1.59	pass
Z025	6.2831	25.124	12.29	2.98	6.4302	3.3014	1.10	37%	1.59	pass
Z026	6.2969	25.132	12.28	2.98	6.4314	3.3024	1.10	37%	1.59	pass
Z027	6.3065	25.177	12.29	2.99	6.4320	3.3024	1.10	37%	1.59	pass
Z028	6.2847	25.135	12.28	2.98	6.4320	3.3024	1.10	37%	1.59	pass
Z029	6.2950	25.146	12.29	2.98	6.4328	3.3024	1.10	37%	1.59	pass
Z030	6.2958	25.135	12.28	2.98	6.4304	3.3014	1.10	37%	1.59	pass
Z031	6.2932	25.153	12.29	2.98	6.4321	3.3024	1.10	37%	1.59	pass
Z032	6.2865	25.132	12.29	2.98	6.4308	3.3014	1.10	37%	1.59	pass
Z033	6.3031	25.139	12.29	2.98	6.4326	3.3024	1.10	37%	1.59	pass
Z034	6.2925	25.156	12.29	2.98	6.4325	3.3024	1.10	37%	1.59	pass
Z035	6.2888	25.116	12.28	2.98	6.4310	3.3024	1.10	37%	1.59	pass
Z036	6.3030	25.130	12.29	2.98	6.4326	3.3024	1.10	37%	1.59	pass
Z037	6.2938	25.126	12.29	2.98	6.4309	3.3014	1.10	37%	1.59	pass
Z038	6.2924	25.182	12.30	2.99	6.4326	3.3024	1.10	37%	1.58	pass
Z039	6.3034	25.184	12.29	2.99	6.4310	3.3024	1.10	37%	1.59	pass
Z040	6.2865	25.130	12.29	2.98	6.4327	3.3024	1.10	37%	1.59	pass
Z041	6.3100	25.139	12.29	2.98	6.4304	3.3014	1.10	37%	1.60	pass
Z042	6.2984	25.153	12.28	2.98	6.4329	3.3024	1.10	37%	1.59	pass
Z043	6.3041	25.135	12.29	2.98	6.4320	3.3024	1.10	37%	1.59	pass
Z044	6.3066	25.153	12.29	2.98	6.4309	3.3014	1.10	37%	1.59	pass
Z045	6.2984	25.184	12.28	2.98	6.4311	3.3024	1.10	37%	1.59	pass
Z046	6.3090	25.195	12.30	3.00	6.4311	3.3024	1.10	37%	1.58	pass
Z047	6.2930	25.133	12.29	2.98	6.4316	3.3024	1.10	37%	1.59	pass
Z048	6.2979	25.118	12.29	2.98	6.4306	3.3014	1.10	37%	1.59	pass
Z049	6.2787	25.133	12.28	2.98	6.4333	3.3034	1.10	37%	1.58	pass
Z050	6.2935	25.147	12.28	2.98	6.4318	3.3024	1.10	37%	1.59	pass

Comments

Average weight per overcoated particle from combined results of 2 independent measurements (W09060801 and W09060802).

Operator — Date: 7-17-09

QC Supervisor — Date: 1-11-10

QA Reviewer — Date: 2/03/10

Data Report Form DRF-24B: Compact Matrix Density

Procedure:	AGR-CHAR-DAM-24 Rev. 6a
Operator:	Hunn/Barker/Dunbar
Compact lot ID:	LEU09-OP2
Compact Lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\CompactDimensions\LEU09-OP2_DRF24R6a.xls

Average weight per TRISO particle (g):	1.032E-03
Average weight per overcoated particle (g):	2.010E-03
Average TRISO particle volume (cm3):	3.430E-04

Acceptance criteria for matrix density:	≥1.45

Compact ID Number	Compact Weight (g)	Length (mm)	Av. Diameter (mm)	Compact Volume (cm3)	Charge Weight (g)	Particle Weight (g)	Particle Volume (cm3)	Packing Fraction	Matrix Density (g/cm3)	Accept? (pass or fail)
Z051	6.3002	25.111	12.29	2.98	6.4303	3.3014	1.10	37%	1.59	pass
Z052	6.3182	25.171	12.29	2.99	6.4315	3.3024	1.10	37%	1.60	pass
Z053	6.2827	25.109	12.28	2.98	6.4321	3.3024	1.10	37%	1.59	pass
Z054	6.3061	25.146	12.29	2.98	6.4316	3.3024	1.10	37%	1.59	pass
Z055	6.2937	25.140	12.29	2.98	6.4321	3.3024	1.10	37%	1.59	pass
Z056	6.3073	25.137	12.28	2.98	6.4316	3.3024	1.10	37%	1.60	pass
Z057	6.2933	25.179	12.29	2.99	6.4309	3.3014	1.10	37%	1.58	pass
Z058	6.2825	25.128	12.29	2.98	6.4295	3.3014	1.10	37%	1.58	pass
Z059	6.2939	25.146	12.29	2.98	6.4307	3.3014	1.10	37%	1.59	pass
Z060	6.2949	25.158	12.29	2.98	6.4308	3.3014	1.10	37%	1.59	pass
Z061	6.2958	25.161	12.29	2.98	6.4323	3.3024	1.10	37%	1.59	pass
Z062	6.2811	25.146	12.29	2.98	6.4306	3.3014	1.10	37%	1.58	pass
Z063	6.2910	25.135	12.28	2.98	6.4314	3.3024	1.10	37%	1.59	pass
Z064	6.3014	25.142	12.29	2.98	6.4314	3.3024	1.10	37%	1.59	pass
Z065	6.2900	25.134	12.28	2.98	6.4321	3.3024	1.10	37%	1.59	pass
Z066	6.2968	25.132	12.29	2.98	6.4300	3.3014	1.10	37%	1.59	pass
Z067	6.2931	25.154	12.29	2.98	6.4311	3.3024	1.10	37%	1.59	pass
Z068	6.3137	25.156	12.29	2.99	6.4325	3.3024	1.10	37%	1.60	pass
Z069	6.3230	25.187	12.29	2.99	6.4325	3.3024	1.10	37%	1.60	pass
Z070	6.2840	25.135	12.29	2.98	6.4324	3.3024	1.10	37%	1.58	pass
Z071	6.3029	25.139	12.28	2.98	6.4326	3.3024	1.10	37%	1.60	pass
Z072	6.3009	25.149	12.29	2.98	6.4323	3.3024	1.10	37%	1.59	pass
Z073	6.2941	25.134	12.29	2.98	6.4311	3.3024	1.10	37%	1.59	pass
Z074	6.3016	25.151	12.29	2.98	6.4308	3.3014	1.10	37%	1.59	pass
Z075	6.3041	25.154	12.29	2.98	6.4309	3.3014	1.10	37%	1.59	pass
Z076	6.3005	25.154	12.30	2.99	6.4331	3.3034	1.10	37%	1.59	pass
Z077	6.2961	25.130	12.29	2.98	6.4319	3.3024	1.10	37%	1.59	pass
Z078	6.2966	25.153	12.29	2.98	6.4323	3.3024	1.10	37%	1.59	pass
Z079	6.3000	25.142	12.29	2.98	6.4323	3.3024	1.10	37%	1.59	pass
Z080	6.2773	25.146	12.29	2.98	6.4322	3.3024	1.10	37%	1.58	pass
Z081	6.3018	25.149	12.29	2.98	6.4314	3.3024	1.10	37%	1.59	pass
Z082	6.2970	25.140	12.28	2.98	6.4313	3.3024	1.10	37%	1.59	pass
Z083	6.3064	25.144	12.29	2.98	6.4302	3.3014	1.10	37%	1.59	pass
Z084	6.2906	25.145	12.29	2.98	6.4325	3.3024	1.10	37%	1.59	pass
Z085	6.2757	25.149	12.28	2.98	6.4303	3.3014	1.10	37%	1.58	pass
Z086	6.3034	25.167	12.29	2.99	6.4322	3.3024	1.10	37%	1.59	pass
Z087	6.2944	25.134	12.29	2.98	6.4328	3.3024	1.10	37%	1.59	pass
Z088	6.3006	25.142	12.29	2.98	6.4320	3.3024	1.10	37%	1.59	pass
Z089	6.3115	25.172	12.30	2.99	6.4304	3.3014	1.10	37%	1.59	pass
Z090	6.2800	25.142	12.29	2.98	6.4321	3.3024	1.10	37%	1.58	pass
Z091	6.2869	25.125	12.29	2.98	6.4302	3.3014	1.10	37%	1.59	pass
Z092	6.3015	25.151	12.29	2.98	6.4317	3.3024	1.10	37%	1.59	pass
Z093	6.2954	25.133	12.29	2.98	6.4310	3.3024	1.10	37%	1.59	pass
Z094	6.2980	25.134	12.29	2.98	6.4314	3.3024	1.10	37%	1.59	pass
Z095	6.2926	25.133	12.28	2.98	6.4306	3.3014	1.10	37%	1.59	pass
Z096	6.3214	25.187	12.30	2.99	6.4322	3.3024	1.10	37%	1.59	pass
Z097	6.3053	25.128	12.29	2.98	6.4321	3.3024	1.10	37%	1.59	pass
Z098	6.2893	25.135	12.29	2.98	6.4316	3.3024	1.10	37%	1.59	pass
Z099	6.2882	25.063	12.28	2.97	6.4321	3.3024	1.10	37%	1.59	pass
Z100	6.2957	25.146	12.29	2.98	6.4321	3.3024	1.10	37%	1.59	pass

Comments
Average weight per overcoated particle from combined results of 2 independent measurements (W09060801 and W09060802).

Operator — 7-17-09 Date

QC Supervisor — 1-11-10 Date

QA Reviewer — 2/03/10 Date

Data Report Form DRF-24B: Compact Matrix Density

Procedure:	AGR-CHAR-DAM-24 Rev. 6a
Operator:	Hunn/Barker/Dunbar
Compact lot ID:	LEU09-OP2
Compact Lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\CompactDimensions\LEU09-OP2_DRF24R6a.xls

Average weight per TRISO particle (g):	1.032E-03
Average weight per overcoated particle (g):	2.010E-03
Average TRISO particle volume (cm3):	3.430E-04

Acceptance criteria for matrix density:	≥1.45

Compact ID Number	Compact Weight (g)	Length (mm)	Av. Diameter (mm)	Compact Volume (cm3)	Charge Weight (g)	Particle Weight (g)	Particle Volume (cm3)	Packing Fraction	Matrix Density (g/cm3)	Accept? (pass or fail)
Z101	6.3040	25.129	12.29	2.98	6.4327	3.3024	1.10	37%	1.59	pass
Z102	6.2944	25.125	12.29	2.98	6.4319	3.3024	1.10	37%	1.59	pass
Z103	6.2859	25.149	12.28	2.98	6.4306	3.3014	1.10	37%	1.59	pass
Z104	6.3137	25.153	12.28	2.98	6.4327	3.3024	1.10	37%	1.60	pass
Z105	6.2989	25.115	12.29	2.98	6.4313	3.3024	1.10	37%	1.59	pass
Z106	6.2897	25.120	12.28	2.98	6.4314	3.3024	1.10	37%	1.59	pass
Z107	6.2884	25.151	12.29	2.98	6.4299	3.3014	1.10	37%	1.58	pass
Z108	6.2840	25.024	12.28	2.96	6.4299	3.3014	1.10	37%	1.60	pass
Z109	6.2941	25.152	12.29	2.98	6.4329	3.3024	1.10	37%	1.59	pass
Z110	6.2837	25.151	12.28	2.98	6.4321	3.3024	1.10	37%	1.58	pass
Z111	6.2904	25.152	12.29	2.98	6.4322	3.3024	1.10	37%	1.59	pass
Z112	6.2922	25.134	12.29	2.98	6.4319	3.3024	1.10	37%	1.59	pass
Z113	6.2861	25.114	12.29	2.98	6.4303	3.3014	1.10	37%	1.59	pass
Z114	6.2934	25.130	12.29	2.98	6.4311	3.3024	1.10	37%	1.59	pass
Z115	6.2832	25.132	12.28	2.98	6.4310	3.3024	1.10	37%	1.59	pass
Z116	6.2870	25.142	12.29	2.98	6.4303	3.3014	1.10	37%	1.58	pass
Z117	6.3025	25.148	12.29	2.98	6.4308	3.3014	1.10	37%	1.59	pass
Z118	6.2928	25.151	12.29	2.98	6.4313	3.3024	1.10	37%	1.59	pass
Z119	6.2985	25.158	12.29	2.98	6.4313	3.3024	1.10	37%	1.59	pass
Z120	6.3053	25.120	12.29	2.98	6.4320	3.3024	1.10	37%	1.59	pass
Z121	6.2959	25.135	12.29	2.98	6.4308	3.3014	1.10	37%	1.59	pass
Z122	6.2843	25.130	12.29	2.98	6.4309	3.3014	1.10	37%	1.59	pass
Z123	6.2986	25.151	12.29	2.98	6.4329	3.3024	1.10	37%	1.59	pass
Z124	6.2830	25.130	12.29	2.98	6.4319	3.3024	1.10	37%	1.58	pass
Z125	6.3026	25.139	12.29	2.98	6.4306	3.3014	1.10	37%	1.59	pass
Z126	6.2944	25.134	12.29	2.98	6.4309	3.3014	1.10	37%	1.59	pass
Z127	6.2828	25.142	12.29	2.98	6.4327	3.3024	1.10	37%	1.58	pass
Z128	6.2886	25.140	12.29	2.98	6.4315	3.3024	1.10	37%	1.59	pass
Z129	6.2837	25.139	12.29	2.98	6.4321	3.3024	1.10	37%	1.58	pass
Z130	6.2855	25.132	12.29	2.98	6.4322	3.3024	1.10	37%	1.58	pass
Z131	6.2804	25.142	12.28	2.98	6.4323	3.3024	1.10	37%	1.58	pass
Z132	6.3422	25.217	12.28	2.99	6.4330	3.3024	1.10	37%	1.61	pass
Z133	6.2959	25.133	12.29	2.98	6.4321	3.3024	1.10	37%	1.59	pass
Z134	6.2983	25.147	12.29	2.98	6.4320	3.3024	1.10	37%	1.59	pass
Z135	6.2972	25.133	12.28	2.98	6.4319	3.3024	1.10	37%	1.59	pass
Z136	6.2922	25.140	12.29	2.98	6.4304	3.3014	1.10	37%	1.59	pass
Z137	6.2877	25.144	12.29	2.98	6.4325	3.3024	1.10	37%	1.58	pass
Z138	6.3043	25.177	12.29	2.99	6.4316	3.3024	1.10	37%	1.59	pass
Z139	6.2862	25.112	12.28	2.97	6.4312	3.3024	1.10	37%	1.59	pass
Z140	6.2964	25.161	12.29	2.98	6.4318	3.3024	1.10	37%	1.59	pass
Z141	6.2819	25.132	12.28	2.98	6.4330	3.3024	1.10	37%	1.58	pass
Z142	6.2926	25.114	12.29	2.98	6.4329	3.3024	1.10	37%	1.59	pass
Z143	6.2894	25.148	12.29	2.98	6.4317	3.3024	1.10	37%	1.59	pass
Z144	6.2958	25.156	12.28	2.98	6.4326	3.3024	1.10	37%	1.59	pass
Z145	6.2905	25.134	12.29	2.98	6.4315	3.3024	1.10	37%	1.59	pass
Z146	6.3008	25.163	12.29	2.98	6.4320	3.3024	1.10	37%	1.59	pass
Z147	6.3024	25.158	12.29	2.98	6.4322	3.3024	1.10	37%	1.59	pass
Z148	6.2992	25.142	12.29	2.98	6.4320	3.3024	1.10	37%	1.59	pass
Z149	6.2842	25.115	12.29	2.98	6.4305	3.3014	1.10	37%	1.59	pass
Z150	6.2950	25.148	12.29	2.98	6.4321	3.3024	1.10	37%	1.59	pass

Comments

Average weight per overcoated particle from combined results of 2 independent measurements (W09060801 and W09060802).

Operator — 7-17-09 Date

QC Supervisor — 1-11-10 Date

QA Reviewer — 2/03/10 Date

Data Report Form DRF-24B: Compact Matrix Density

Procedure:	AGR-CHAR-DAM-24 Rev. 6a
Operator:	Hunn/Barker/Dunbar
Compact lot ID:	LEU09-OP2
Compact Lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\CompactDimensions\LEU09-OP2_DRF24R6a.xls

Average weight per TRISO particle (g):	1.032E-03
Average weight per overcoated particle (g):	2.010E-03
Average TRISO particle volume (cm3):	3.430E-04

Acceptance criteria for matrix density:	≥1.45

Compact ID Number	Compact Weight (g)	Length (mm)	Av. Diameter (mm)	Compact Volume (cm3)	Charge Weight (g)	Particle Weight (g)	Particle Volume (cm3)	Packing Fraction	Matrix Density (g/cm3)	Accept? (pass or fail)
Z151	6.2941	25.156	12.29	2.98	6.4315	3.3024	1.10	37%	1.59	pass
Z152	6.3043	25.140	12.29	2.98	6.4319	3.3024	1.10	37%	1.59	pass
Z153	6.2956	25.173	12.29	2.98	6.4305	3.3014	1.10	37%	1.59	pass
Z154	6.2861	25.146	12.29	2.98	6.4311	3.3024	1.10	37%	1.58	pass
Z155	6.2828	25.125	12.29	2.98	6.4305	3.3014	1.10	37%	1.58	pass
Z156	6.3057	25.156	12.29	2.98	6.4330	3.3024	1.10	37%	1.59	pass
Z157	6.3038	25.152	12.29	2.98	6.4315	3.3024	1.10	37%	1.59	pass
Z158	6.2780	25.133	12.28	2.98	6.4313	3.3024	1.10	37%	1.58	pass
Z159	6.3027	25.132	12.29	2.98	6.4321	3.3024	1.10	37%	1.59	pass
Z160	6.2813	25.060	12.28	2.97	6.4320	3.3024	1.10	37%	1.59	pass
Z161	6.2758	25.140	12.29	2.98	6.4308	3.3014	1.10	37%	1.58	pass
Z162	6.2839	25.125	12.29	2.98	6.4323	3.3024	1.10	37%	1.59	pass
Z163	6.2985	25.142	12.29	2.98	6.4321	3.3024	1.10	37%	1.59	pass
Z164	6.2829	25.048	12.29	2.97	6.4319	3.3024	1.10	37%	1.59	pass
Z165	6.2897	25.116	12.28	2.97	6.4317	3.3024	1.10	37%	1.59	pass
Z166	6.2864	25.161	12.29	2.98	6.4303	3.3014	1.10	37%	1.58	pass
Z167	6.2828	25.168	12.29	2.98	6.4315	3.3024	1.10	37%	1.58	pass
Z168										
Z169										
Z170										
Z171										
Z172										
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Z194										
Z195										
Z196										
Z197										
Z198										
Z199										
Z200										

Comments

Average weight per overcoated particle from combined results of 2 independent measurements (W09060801 and W09060802).

Operator — Date: 7-17-09

QC Supervisor — Date: 1-11-10

QA Reviewer — Date: 2/03/10

Data Report Form DRF-24C: Compact Tracking

Procedure:	AGR-CHAR-DAM-24 Rev. 6a
Operator:	Hunn/Barker/Dunbar
Compact lot ID:	LEU09-OP2
Compact Lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\CompactDimensions\LEU09-OP2_DRF24R6a.xls

Compact Z Number	Compact G Number	Compact Z Number	Compact G Number	Compact Z Number	Compact G Number	Compact Z Number	Compact G Number	Compact Z Number	Compact G Number
Z001	G094	Z051	G116	Z101	G179	Z151	G133	Z201	
Z002	G019	Z052	G083	Z102	G158	Z152	G100	Z202	
Z003	G041	Z053	G013	Z103	G131	Z153	G108	Z203	
Z004	G087	Z054	G107	Z104	G183	Z154	G115	Z204	
Z005	G153	Z055	G121	Z105	G092	Z155	G161	Z205	
Z006	G008	Z056	G077	Z106	G091	Z156	G072	Z206	
Z007	G111	Z057	G086	Z107	G166	Z157	G149	Z207	
Z008	G039	Z058	G138	Z108	G005	Z158	G137	Z208	
Z009	G053	Z059	G134	Z109	G141	Z159	G127	Z209	
Z010	G118	Z060	G144	Z110	G129	Z160	G004	Z210	
Z011	G096	Z061	G167	Z111	G132	Z161	G010	Z211	
Z012	G082	Z062	G028	Z112	G017	Z162	G014	Z212	
Z013	G069	Z063	G139	Z113	G029	Z163	G088	Z213	
Z014	G026	Z064	G057	Z114	G164	Z164	G001	Z214	
Z015	G006	Z065	G173	Z115	G095	Z165	G089	Z215	
Z016	G047	Z066	G098	Z116	G160	Z166	G159	Z216	
Z017	G048	Z067	G120	Z117	G165	Z167	G031	Z217	
Z018	G046	Z068	G079	Z118	G168	Z168		Z218	
Z019	G061	Z069	G081	Z119	G102	Z169		Z219	
Z020	G080	Z070	G035	Z120	G174	Z170		Z220	
Z021	G036	Z071	G093	Z121	G103	Z171		Z221	
Z022	G135	Z072	G181	Z122	G030	Z172		Z222	
Z023	G085	Z073	G143	Z123	G101	Z173		Z223	
Z024	G099	Z074	G051	Z124	G018	Z174		Z224	
Z025	G052	Z075	G122	Z125	G110	Z175		Z225	
Z026	G109	Z076	G178	Z126	G125	Z176		Z226	
Z027	G060	Z077	G113	Z127	G038	Z177		Z227	
Z028	G163	Z078	G126	Z128	G151	Z178		Z228	
Z029	G114	Z079	G070	Z129	G172	Z179		Z229	
Z030	G075	Z080	G032	Z130	G064	Z180		Z230	
Z031	G009	Z081	G182	Z131	G025	Z181		Z231	
Z032	G027	Z082	G154	Z132	G045	Z182		Z232	
Z033	G148	Z083	G076	Z133	G169	Z183		Z233	
Z034	G050	Z084	G152	Z134	G106	Z184		Z234	
Z035	G015	Z085	G011	Z135	G073	Z185		Z235	
Z036	G156	Z086	G059	Z136	G170	Z186		Z236	
Z037	G058	Z087	G117	Z137	G171	Z187		Z237	
Z038	G044	Z088	G124	Z138	G078	Z188		Z238	
Z039	G074	Z089	G063	Z139	G066	Z189		Z239	
Z040	G162	Z090	G040	Z140	G180	Z190		Z240	
Z041	G185	Z091	G140	Z141	G136	Z191		Z241	
Z042	G097	Z092	G184	Z142	G037	Z192		Z242	
Z043	G175	Z093	G123	Z143	G043	Z193		Z243	
Z044	G176	Z094	G055	Z144	G071	Z194		Z244	
Z045	G049	Z095	G067	Z145	G054	Z195		Z245	
Z046	G062	Z096	G084	Z146	G128	Z196		Z246	
Z047	G142	Z097	G177	Z147	G112	Z197		Z247	
Z048	G157	Z098	G042	Z148	G090	Z198		Z248	
Z049	G012	Z099	G007	Z149	G150	Z199		Z249	
Z050	G145	Z100	G056	Z150	G119	Z200		Z250	

Comments

Operator

7-17-09

Date

Data Report Form DRF-24D: Compact Charge Weight

Procedure:	AGR-CHAR-DAM-24 Rev. 6a
Operator:	Hunn/Barker/Dunbar
Compact lot ID:	LEU09-OP2
Compact Lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\CompactDimensions\LEU09-OP2_DRF24R6a.xls

Analytical balance calibration due date:	10/29/09

Target compact charge weight (g):	6.4313
Allowable tolerance in compact charge weight (g):	0.0020
Average weight per overcoated particle (g):	2.010E-03
Approximate number of particles per compact:	3200
Average uranium loading per particle (g):	3.964E-04
Approximate uranium loading per compact (g):	1.268

Compact G Number	Charge Weight (g)	Compact G Number	Charge Weight (g)	Compact G Number	Charge Weight (g)	Compact G Number	Charge Weight (g)	Compact G Number	Charge Weight (g)
G001	6.4319	G051	6.4308	G101	6.4329	G151	6.4315	G201	
G002	6.4322	G052	6.4302	G102	6.4313	G152	6.4325	G202	
G003	6.4309	G053	6.4326	G103	6.4308	G153	6.4309	G203	
G004	6.4320	G054	6.4315	G104	6.4311	G154	6.4313	G204	
G005	6.4299	G055	6.4314	G105	6.4326	G155	6.4311	G205	
G006	6.4325	G056	6.4321	G106	6.4320	G156	6.4326	G206	
G007	6.4321	G057	6.4314	G107	6.4316	G157	6.4306	G207	
G008	6.4313	G058	6.4309	G108	6.4305	G158	6.4319	G208	
G009	6.4321	G059	6.4322	G109	6.4314	G159	6.4303	G209	
G010	6.4308	G060	6.4320	G110	6.4306	G160	6.4303	G210	
G011	6.4303	G061	6.4325	G111	6.4311	G161	6.4305	G211	
G012	6.4333	G062	6.4311	G112	6.4322	G162	6.4327	G212	
G013	6.4321	G063	6.4304	G113	6.4319	G163	6.4320	G213	
G014	6.4323	G064	6.4322	G114	6.4328	G164	6.4311	G214	
G015	6.4310	G065	6.4319	G115	6.4311	G165	6.4308	G215	
G016	6.4304	G066	6.4312	G116	6.4303	G166	6.4299	G216	
G017	6.4319	G067	6.4306	G117	6.4328	G167	6.4323	G217	
G018	6.4319	G068	6.4308	G118	6.4322	G168	6.4313	G218	
G019	6.4306	G069	6.4313	G119	6.4321	G169	6.4321	G219	
G020	6.4307	G070	6.4323	G120	6.4311	G170	6.4304	G220	
G021	6.4300	G071	6.4326	G121	6.4321	G171	6.4325	G221	
G022	6.4309	G072	6.4330	G122	6.4309	G172	6.4321	G222	
G023	6.4316	G073	6.4319	G123	6.4310	G173	6.4321	G223	
G024	6.4303	G074	6.4310	G124	6.4320	G174	6.4320	G224	
G025	6.4323	G075	6.4304	G125	6.4309	G175	6.4320	G225	
G026	6.4311	G076	6.4302	G126	6.4323	G176	6.4309	G226	
G027	6.4308	G077	6.4316	G127	6.4321	G177	6.4321	G227	
G028	6.4306	G078	6.4316	G128	6.4320	G178	6.4331	G228	
G029	6.4303	G079	6.4325	G129	6.4321	G179	6.4327	G229	
G030	6.4309	G080	6.4312	G130	6.4314	G180	6.4318	G230	
G031	6.4315	G081	6.4325	G131	6.4306	G181	6.4323	G231	
G032	6.4322	G082	6.4329	G132	6.4322	G182	6.4314	G232	
G033	6.4307	G083	6.4315	G133	6.4315	G183	6.4327	G233	
G034	6.4325	G084	6.4322	G134	6.4307	G184	6.4317	G234	
G035	6.4324	G085	6.4314	G135	6.4311	G185	6.4304	G235	
G036	6.4323	G086	6.4309	G136	6.4330	G186		G236	
G037	6.4329	G087	6.4318	G137	6.4313	G187		G237	
G038	6.4327	G088	6.4321	G138	6.4295	G188		G238	
G039	6.4318	G089	6.4317	G139	6.4314	G189		G239	
G040	6.4321	G090	6.4320	G140	6.4302	G190		G240	
G041	6.4303	G091	6.4314	G141	6.4329	G191		G241	
G042	6.4316	G092	6.4313	G142	6.4316	G192		G242	
G043	6.4317	G093	6.4326	G143	6.4311	G193		G243	
G044	6.4326	G094	6.4327	G144	6.4308	G194		G244	
G045	6.4330	G095	6.4310	G145	6.4318	G195		G245	
G046	6.4329	G096	6.4307	G146	6.4301	G196		G246	
G047	6.4315	G097	6.4329	G147	6.4325	G197		G247	
G048	6.4322	G098	6.4300	G148	6.4326	G198		G248	
G049	6.4311	G099	6.4302	G149	6.4315	G199		G249	
G050	6.4325	G100	6.4319	G150	6.4305	G200		G250	

Comments

Average weight per overcoated particle from combined results of 2 independent measurements (W09060801 and W09060802).

Operator

6-23-09

Date

Data Report Form DRF-25: Fuel Compact Mean Uranium Loading

Procedure:	AGR-CHAR-DAM-25 Rev. 2
Operator:	Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Filename:	\\mc-agr\AGR\UraniumLoading\LEU09-OP2-Z_DRF25R2.xls

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
Compact ID number:	Z076	Z145	Z064	Z045	Z148	Z163
First Leach						
Sample tube ID number:	U09090101	U09090102	U09090103	U09090104	U09090105	U09090106
Radiochemical laboratory analysis number:	2208-001	2208-002	2208-003	2208-004	2208-005	2208-006
Weight U in leach (g):	1.255	1.261	1.258	1.251	1.258	1.258
Uncertainty in weight U in leach (g):	0.005	0.005	0.005	0.005	0.005	0.005
Second Leach						
Sample tube ID number:	U09090301	U09090302	U09090303	U09090304	U09090305	U09090306
Radiochemical laboratory analysis number:	2208-007	2208-008	2208-009	2208-010	2208-011	2208-012
Weight U in leach (g):	1.36E-05	1.39E-05	1.27E-05	1.00E-05	8.86E-06	6.06E-06
Uncertainty in weight U in leach (g):	1.36E-06	1.39E-06	1.27E-06	1.00E-06	8.86E-07	6.06E-07
Total Measured U						
Weight U in compact (g):	1.255	1.261	1.258	1.251	1.258	1.258
Uncertainty in weight U in compact (g):	0.005	0.005	0.005	0.005	0.005	0.005

Mean uranium loading (gU/compact):	1.257
Standard deviation in mean uranium loading (gU/compact):	0.003

Comments
Leach 1 was analyzed by Davies-Gray titration method. Leach 2 was analyzed by ICP-MS due to low U concentration.
Davies Gray: Initial known U recovery = 100.37%; Final Known U recovery = 100.13%; Blind titration U recovery = 100.19%
Uncertainty in Davies-Gray (0.4%) based on average of measured % recovery data for LEU06,07,08,09.
Isotopic composition (wt%): 234U=0.148±0.001; 235U=13.993±0.017; 236U=0.0504±0.0004; 238U=85.809±0.018
Data checked against official results of analyses for RMAL2208 by FCM on 11/12/2009

Fred C. Montgomery
Operator

11-17-2009
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	011, 152, 001, 068, 046
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_01.xls

Mean average weight uranium per particle (g):	3.964E-04
Uncertainty in mean average weight uranium per particle (g):	8.1E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09080301	L09080501	
	Number of compacts:	5		
	Total volume of leach solution (ml):	134.0	126.0	
	Radiochemical laboratory analysis number:	2134-001	2134-006	
	Measured uranium concentration (µg/ml):	7.35E-02	8.42E-03	
	Uncertainty in uranium concentration (µg/ml):	7.35E-03	8.42E-04	
	Weight uranium leached (g):	9.85E-06	1.06E-06	1.09E-05
	Uncertainty in weight uranium leached (g):	9.86E-07	1.06E-07	9.92E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.52	< 5.19	<10.71
	Weight of impurity in blank (µg):	< 6.55	< 5.07	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.52	5.19	10.71
Cr	Measured concentration of impurity in sample (µg/ml):	7.22E-03	3.85E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.97	0.49	1.45
	Weight of impurity in blank (µg):	< 0.32	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.65	0.24	0.89
	Maximum corrected weight of impurity in sample (µg):	0.97	0.49	1.45
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.26	< 0.24	< 0.50
	Weight of impurity in blank (µg):	< 0.30	< 0.23	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.26	0.24	0.50
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.22	< 0.20	< 0.42
	Weight of impurity in blank (µg):	< 0.26	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.22	0.20	0.42
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 1.07	< 1.01	< 2.08
	Weight of impurity in blank (µg):	< 1.27	< 0.98	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	1.07	1.01	2.08
Ca	Measured concentration of impurity in sample (µg/ml):	< 1.00E-01	< 1.00E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	<13.40	<12.60	<26.00
	Weight of impurity in blank (µg):	<15.90	<12.30	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	13.40	12.60	26.00
Al	Measured concentration of impurity in sample (µg/ml):	4.56E-01	1.28E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	61.10	16.13	77.23
	Weight of impurity in blank (µg):	5.99	3.48	
	Minimum corrected weight of impurity in sample (µg):	55.11	12.65	67.76
	Maximum corrected weight of impurity in sample (µg):	55.11	12.65	67.76
Ti	Measured concentration of impurity in sample (µg/ml):	2.31E-02	1.97E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	3.10	2.48	5.58
	Weight of impurity in blank (µg):	< 1.27	< 0.98	
	Minimum corrected weight of impurity in sample (µg):	1.82	1.50	3.32
	Maximum corrected weight of impurity in sample (µg):	3.10	2.48	5.58
V	Measured concentration of impurity in sample (µg/ml):	2.47E-01	5.51E-02	**V**
	Uncorrected weight of impurity in sample (µg):	33.10	6.94	40.04
	Weight of impurity in blank (µg):	< 0.32	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	32.78	6.70	39.48
	Maximum corrected weight of impurity in sample (µg):	33.10	6.94	40.04

Comments

Data checked against RMAL 2134 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	067, 081, 019, 008, 032
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_01.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09080303	L09080503	
	Number of compacts:	5		
	Total volume of leach solution (ml):	135.0	121.0	
	Radiochemical laboratory analysis number:	2134-003	2134-008	
	Measured uranium concentration (µg/ml):	7.15E-02	8.66E-03	
	Uncertainty in uranium concentration (µg/ml):	7.15E-03	8.66E-04	
	Weight uranium leached (g):	9.65E-06	1.05E-06	1.07E-05
	Uncertainty in weight uranium leached (g):	9.66E-07	1.05E-07	9.72E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.56	< 4.99	<10.55
	Weight of impurity in blank (µg):	< 6.55	< 5.07	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.56	4.99	10.55
Cr	Measured concentration of impurity in sample (µg/ml):	4.61E-03	4.31E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.62	0.52	1.14
	Weight of impurity in blank (µg):	< 0.32	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.30	0.28	0.58
	Maximum corrected weight of impurity in sample (µg):	0.62	0.52	1.14
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.26	< 0.23	< 0.49
	Weight of impurity in blank (µg):	< 0.30	< 0.23	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.26	0.23	0.49
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.22	< 0.20	< 0.41
	Weight of impurity in blank (µg):	< 0.26	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.22	0.20	0.41
Ni	Measured concentration of impurity in sample (µg/ml):	1.14E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	1.54	< 0.97	< 2.51
	Weight of impurity in blank (µg):	< 1.27	< 0.98	
	Minimum corrected weight of impurity in sample (µg):	0.27	0.00	0.27
	Maximum corrected weight of impurity in sample (µg):	1.54	0.97	2.51
Ca	Measured concentration of impurity in sample (µg/ml):	1.93E-01	1.03E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	26.06	12.46	38.52
	Weight of impurity in blank (µg):	<15.90	<12.30	
	Minimum corrected weight of impurity in sample (µg):	10.16	0.16	10.32
	Maximum corrected weight of impurity in sample (µg):	26.06	12.46	38.52
Al	Measured concentration of impurity in sample (µg/ml):	3.95E-01	8.21E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	53.33	9.93	63.26
	Weight of impurity in blank (µg):	5.99	3.48	
	Minimum corrected weight of impurity in sample (µg):	47.33	6.45	53.78
	Maximum corrected weight of impurity in sample (µg):	47.33	6.45	53.78
Ti	Measured concentration of impurity in sample (µg/ml):	2.14E-02	1.91E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	2.89	2.31	5.20
	Weight of impurity in blank (µg):	< 1.27	< 0.98	
	Minimum corrected weight of impurity in sample (µg):	1.62	1.33	2.94
	Maximum corrected weight of impurity in sample (µg):	2.89	2.31	5.20
V	Measured concentration of impurity in sample (µg/ml):	2.51E-01	5.57E-02	**V**
	Uncorrected weight of impurity in sample (µg):	33.89	6.74	40.62
	Weight of impurity in blank (µg):	< 0.32	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	33.57	6.49	40.06
	Maximum corrected weight of impurity in sample (µg):	33.89	6.74	40.62

Comments

Data checked against RMAL 2134 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	039, 036, 155, 012, 117
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_01.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
Deconsolidation-leach solution ID:		L09080304	L09080504	
Number of compacts:		5		
Total volume of leach solution (ml):		139.0	126.0	
Radiochemical laboratory analysis number:		2134-004	2134-009	
Measured uranium concentration (µg/ml):		7.19E-02	1.01E-02	
Uncertainty in uranium concentration (µg/ml):		7.19E-03	1.01E-03	
Weight uranium leached (g):		9.99E-06	1.27E-06	1.13E-05
Uncertainty in weight uranium leached (g):		1.00E-06	1.27E-07	1.01E-06
Effective number of exposed kernels:		0.0	0.0	0.0
Uncertainty in effective number of exposed kernels:		0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.73	< 5.19	<10.92
	Weight of impurity in blank (µg):	< 6.55	< 5.07	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.73	5.19	10.92
Cr	Measured concentration of impurity in sample (µg/ml):	1.01E-02	7.10E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.40	0.89	2.30
	Weight of impurity in blank (µg):	< 0.32	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	1.09	0.65	1.73
	Maximum corrected weight of impurity in sample (µg):	1.40	0.89	2.30
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.27	< 0.24	< 0.51
	Weight of impurity in blank (µg):	< 0.30	< 0.23	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.27	0.24	0.51
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.23	< 0.20	< 0.43
	Weight of impurity in blank (µg):	< 0.26	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.23	0.20	0.43
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 1.11	< 1.01	< 2.12
	Weight of impurity in blank (µg):	< 1.27	< 0.98	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	1.11	1.01	2.12
Ca	Measured concentration of impurity in sample (µg/ml):	4.74E-01	< 1.00E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	65.89	<12.60	<78.49
	Weight of impurity in blank (µg):	<15.90	<12.30	
	Minimum corrected weight of impurity in sample (µg):	49.99	0.00	49.99
	Maximum corrected weight of impurity in sample (µg):	65.89	12.60	78.49
Al	Measured concentration of impurity in sample (µg/ml):	4.34E-01	1.06E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	60.33	13.36	73.68
	Weight of impurity in blank (µg):	5.99	3.48	
	Minimum corrected weight of impurity in sample (µg):	54.33	9.88	64.21
	Maximum corrected weight of impurity in sample (µg):	54.33	9.88	64.21
Ti	Measured concentration of impurity in sample (µg/ml):	4.88E-02	3.50E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	6.78	4.41	11.19
	Weight of impurity in blank (µg):	< 1.27	< 0.98	
	Minimum corrected weight of impurity in sample (µg):	5.51	3.43	8.94
	Maximum corrected weight of impurity in sample (µg):	6.78	4.41	11.19
V	Measured concentration of impurity in sample (µg/ml):	2.48E-01	4.64E-02	**V**
	Uncorrected weight of impurity in sample (µg):	34.47	5.85	40.32
	Weight of impurity in blank (µg):	< 0.32	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	34.15	5.60	39.75
	Maximum corrected weight of impurity in sample (µg):	34.47	5.85	40.32

Comments

Data checked against RMAL 2134 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	031, 149, 093, 147, 072
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_01.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
Deconsolidation-leach solution ID:		L09080305	L09080505	
Number of compacts:		5		
Total volume of leach solution (ml):		124.0	113.0	
Radiochemical laboratory analysis number:		2134-005	2134-010	
Measured uranium concentration (µg/ml):		8.17E-02	1.30E-02	
Uncertainty in uranium concentration (µg/ml):		8.17E-03	1.30E-03	
Weight uranium leached (g):		1.01E-05	1.47E-06	1.16E-05
Uncertainty in weight uranium leached (g):		1.01E-06	1.47E-07	1.03E-06
Effective number of exposed kernels:		0.0	0.0	0.0
Uncertainty in effective number of exposed kernels:		0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.11	< 4.66	< 9.76
	Weight of impurity in blank (µg):	< 6.55	< 5.07	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.11	4.66	9.76
Cr	Measured concentration of impurity in sample (µg/ml):	9.62E-03	5.82E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.19	0.66	1.85
	Weight of impurity in blank (µg):	< 0.32	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.87	0.41	1.29
	Maximum corrected weight of impurity in sample (µg):	1.19	0.66	1.85
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.24	< 0.22	< 0.45
	Weight of impurity in blank (µg):	< 0.30	< 0.23	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.24	0.22	0.45
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.20	< 0.18	< 0.38
	Weight of impurity in blank (µg):	< 0.26	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.20	0.18	0.38
Ni	Measured concentration of impurity in sample (µg/ml):	8.69E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	1.08	< 0.90	< 1.98
	Weight of impurity in blank (µg):	< 1.27	< 0.98	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	1.08	0.90	1.98
Ca	Measured concentration of impurity in sample (µg/ml):	3.48E-01	< 1.00E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	43.15	<11.30	<54.45
	Weight of impurity in blank (µg):	<15.90	<12.30	
	Minimum corrected weight of impurity in sample (µg):	27.25	0.00	27.25
	Maximum corrected weight of impurity in sample (µg):	43.15	11.30	54.45
Al	Measured concentration of impurity in sample (µg/ml):	4.95E-01	1.70E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	61.38	19.21	80.59
	Weight of impurity in blank (µg):	5.99	3.48	
	Minimum corrected weight of impurity in sample (µg):	55.39	15.73	71.11
	Maximum corrected weight of impurity in sample (µg):	55.39	15.73	71.11
Ti	Measured concentration of impurity in sample (µg/ml):	2.06E-02	1.97E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	2.55	2.23	4.78
	Weight of impurity in blank (µg):	< 1.27	< 0.98	
	Minimum corrected weight of impurity in sample (µg):	1.28	1.24	2.52
	Maximum corrected weight of impurity in sample (µg):	2.55	2.23	4.78
V	Measured concentration of impurity in sample (µg/ml):	2.57E-01	7.28E-02	**V**
	Uncorrected weight of impurity in sample (µg):	31.87	8.23	40.09
	Weight of impurity in blank (µg):	< 0.32	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	31.55	7.98	39.53
	Maximum corrected weight of impurity in sample (µg):	31.87	8.23	40.09

Comments

Data checked against RMAL 2134 official results of Analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	Deconsolidation Leach Blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_01.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09080302	L09080502	
	Number of compacts:	None		
	Total volume of leach solution (ml):	159.0	123.0	
	Radiochemical laboratory analysis number:	2134-002	2134-007	
	Measured uranium concentration (µg/ml):	<2.00E-04	2.24E-04	
	Uncertainty in uranium concentration (µg/ml):		2.24E-05	
	Weight uranium leached (g):	<3.18E-08	2.76E-08	<5.94E-08
	Uncertainty in weight uranium leached (g):		2.76E-09	
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:		0.0	
Fe	Measured concentration (µg/ml):	< 4.12E-02	< 4.12E-02	Fe
	Total weight of leached impurity (µg):	< 6.55	< 5.07	<11.62
Cr	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	Cr
	Total weight of leached impurity (µg):	< 0.32	< 0.25	< 0.56
Mn	Measured concentration (µg/ml):	< 1.91E-03	< 1.91E-03	Mn
	Total weight of leached impurity (µg):	< 0.30	< 0.23	< 0.54
Co	Measured concentration (µg/ml):	< 1.62E-03	< 1.62E-03	Co
	Total weight of leached impurity (µg):	< 0.26	< 0.20	< 0.46
Ni	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	Ni
	Total weight of leached impurity (µg):	< 1.27	< 0.98	< 2.26
Ca	Measured concentration (µg/ml):	< 1.00E-01	< 1.00E-01	Ca
	Total weight of leached impurity (µg):	<15.90	<12.30	<28.20
Al	Measured concentration (µg/ml):	3.77E-02	2.83E-02	Al
	Total weight of leached impurity (µg):	5.99	3.48	9.48
Ti	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	Ti
	Total weight of leached impurity (µg):	< 1.27	< 0.98	< 2.26
V	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	V
	Total weight of leached impurity (µg):	< 0.32	< 0.25	< 0.56

Comments

Data checked against RMAL 2134 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	011, 152, 001, 068, 046
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_01.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09081401	B09081701	
	Number of compacts:	5		
	Total volume of leach solution (ml):	51.0	52.0	
	Radiochemical laboratory analysis number:	2157-016	2157-021	
	Measured uranium concentration (µg/ml):	3.11E-01	2.89E-03	
	Uncertainty in uranium concentration (µg/ml):	3.11E-02	2.89E-04	
	Weight uranium leached (g):	1.59E-05	1.50E-07	1.60E-05
	Uncertainty in weight uranium leached (g):	1.60E-06	1.51E-08	1.60E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	7.89E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	4.02	< 2.14	< 6.17
	Weight of impurity in blank (µg):	< 2.15	< 2.10	
	Minimum corrected weight of impurity in sample (µg):	1.87	0.00	1.87
	Maximum corrected weight of impurity in sample (µg):	4.02	2.14	6.17
Cr	Measured concentration of impurity in sample (µg/ml):	2.26E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.15	< 0.10	< 1.26
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	1.05	0.00	1.05
	Maximum corrected weight of impurity in sample (µg):	1.15	0.10	1.26
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.10	< 0.20
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.10	0.20
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.08	< 0.17
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.08	0.17
Ni	Measured concentration of impurity in sample (µg/ml):	3.94E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	2.01	< 0.42	< 2.43
	Weight of impurity in blank (µg):	< 0.42	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	1.59	0.00	1.59
	Maximum corrected weight of impurity in sample (µg):	2.01	0.42	2.43
Ca	Measured concentration of impurity in sample (µg/ml):	2.52E+00	1.68E+00	**Ca**
	Uncorrected weight of impurity in sample (µg):	128.52	87.36	215.88
	Weight of impurity in blank (µg):	9.92	97.41	
	Minimum corrected weight of impurity in sample (µg):	118.60	0.00	118.60
	Maximum corrected weight of impurity in sample (µg):	118.60	0.00	118.60
Al	Measured concentration of impurity in sample (µg/ml):	1.58E+00	4.90E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	80.58	2.55	83.13
	Weight of impurity in blank (µg):	3.05	1.28	
	Minimum corrected weight of impurity in sample (µg):	77.53	1.27	78.80
	Maximum corrected weight of impurity in sample (µg):	77.53	1.27	78.80
Ti	Measured concentration of impurity in sample (µg/ml):	1.44E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	7.34	< 0.42	< 7.76
	Weight of impurity in blank (µg):	< 0.42	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	6.93	0.00	6.93
	Maximum corrected weight of impurity in sample (µg):	7.34	0.42	7.76
V	Measured concentration of impurity in sample (µg/ml):	1.06E+00	6.43E-03	**V**
	Uncorrected weight of impurity in sample (µg):	54.06	0.33	54.39
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	53.96	0.23	54.19
	Maximum corrected weight of impurity in sample (µg):	54.06	0.33	54.39

Comments

Data checked against RMAL 2157 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	067, 081, 019, 008, 032
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_01.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09081403	B09081703	
	Number of compacts:	5		
	Total volume of leach solution (ml):	50.5	52.8	
	Radiochemical laboratory analysis number:	2157-018	2157-023	
	Measured uranium concentration (µg/ml):	3.09E-01	3.43E-03	
	Uncertainty in uranium concentration (µg/ml):	3.09E-02	3.43E-04	
	Weight uranium leached (g):	1.56E-05	1.81E-07	1.58E-05
	Uncertainty in weight uranium leached (g):	1.57E-06	1.82E-08	1.57E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	4.42E-01	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	22.32	< 2.18	<24.50
	Weight of impurity in blank (µg):	< 2.15	< 2.10	
	Minimum corrected weight of impurity in sample (µg):	20.17	0.00	20.17
	Maximum corrected weight of impurity in sample (µg):	22.32	2.18	24.50
Cr	Measured concentration of impurity in sample (µg/ml):	2.24E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.13	< 0.11	< 1.24
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	1.03	0.00	1.03
	Maximum corrected weight of impurity in sample (µg):	1.13	0.11	1.24
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.10	< 0.20
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.10	0.20
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.09	< 0.17
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.09	0.17
Ni	Measured concentration of impurity in sample (µg/ml):	7.44E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	3.76	< 0.42	< 4.18
	Weight of impurity in blank (µg):	< 0.42	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	3.34	0.00	3.34
	Maximum corrected weight of impurity in sample (µg):	3.76	0.42	4.18
Ca	Measured concentration of impurity in sample (µg/ml):	3.96E+00	5.26E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	199.98	27.77	227.75
	Weight of impurity in blank (µg):	9.92	97.41	
	Minimum corrected weight of impurity in sample (µg):	190.06	0.00	190.06
	Maximum corrected weight of impurity in sample (µg):	190.06	0.00	190.06
Al	Measured concentration of impurity in sample (µg/ml):	1.61E+00	3.57E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	81.31	1.88	83.19
	Weight of impurity in blank (µg):	3.05	1.28	
	Minimum corrected weight of impurity in sample (µg):	78.25	0.61	78.86
	Maximum corrected weight of impurity in sample (µg):	78.25	0.61	78.86
Ti	Measured concentration of impurity in sample (µg/ml):	1.61E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	8.13	< 0.42	< 8.55
	Weight of impurity in blank (µg):	< 0.42	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	7.71	0.00	7.71
	Maximum corrected weight of impurity in sample (µg):	8.13	0.42	8.55
V	Measured concentration of impurity in sample (µg/ml):	1.20E+00	7.76E-03	**V**
	Uncorrected weight of impurity in sample (µg):	60.60	0.41	61.01
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	60.50	0.31	60.80
	Maximum corrected weight of impurity in sample (µg):	60.60	0.41	61.01

Comments

Data checked against RMAL 2157 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	039, 036, 155, 012, 117
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_01.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09081404	B09081704	
	Number of compacts:	5		
	Total volume of leach solution (ml):	50.0	52.5	
	Radiochemical laboratory analysis number:	2157-019	2157-024	
	Measured uranium concentration (µg/ml):	2.86E-01	3.98E-03	
	Uncertainty in uranium concentration (µg/ml):	2.86E-02	3.98E-04	
	Weight uranium leached (g):	1.43E-05	2.09E-07	1.45E-05
	Uncertainty in weight uranium leached (g):	1.44E-06	2.11E-08	1.44E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	5.90E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	2.95	< 2.16	< 5.11
	Weight of impurity in blank (µg):	< 2.15	< 2.10	
	Minimum corrected weight of impurity in sample (µg):	0.80	0.00	0.80
	Maximum corrected weight of impurity in sample (µg):	2.95	2.16	5.11
Cr	Measured concentration of impurity in sample (µg/ml):	2.11E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.06	< 0.11	< 1.16
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.95	0.00	0.95
	Maximum corrected weight of impurity in sample (µg):	1.06	0.11	1.16
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.10	< 0.20
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.10	0.20
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.09	< 0.17
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.09	0.17
Ni	Measured concentration of impurity in sample (µg/ml):	1.51E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	0.76	< 0.42	< 1.18
	Weight of impurity in blank (µg):	< 0.42	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	0.34	0.00	0.34
	Maximum corrected weight of impurity in sample (µg):	0.76	0.42	1.18
Ca	Measured concentration of impurity in sample (µg/ml):	2.36E+00	4.92E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	118.00	25.83	143.83
	Weight of impurity in blank (µg):	9.92	97.41	
	Minimum corrected weight of impurity in sample (µg):	108.08	0.00	108.08
	Maximum corrected weight of impurity in sample (µg):	108.08	0.00	108.08
Al	Measured concentration of impurity in sample (µg/ml):	1.60E+00	5.00E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	80.00	2.63	82.63
	Weight of impurity in blank (µg):	3.05	1.28	
	Minimum corrected weight of impurity in sample (µg):	76.95	1.35	78.30
	Maximum corrected weight of impurity in sample (µg):	76.95	1.35	78.30
Ti	Measured concentration of impurity in sample (µg/ml):	9.27E-02	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	4.64	< 0.42	< 5.06
	Weight of impurity in blank (µg):	< 0.42	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	4.22	0.00	4.22
	Maximum corrected weight of impurity in sample (µg):	4.64	0.42	5.06
V	Measured concentration of impurity in sample (µg/ml):	1.02E+00	7.92E-03	**V**
	Uncorrected weight of impurity in sample (µg):	51.00	0.42	51.42
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	50.90	0.31	51.21
	Maximum corrected weight of impurity in sample (µg):	51.00	0.42	51.42

Comments

Data checked against RMAL 2157 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	031, 149, 093, 147, 072
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_01.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09081405	B09081705	
	Number of compacts:	5		
	Total volume of leach solution (ml):	52.0	52.5	
	Radiochemical laboratory analysis number:	2157-020	2157-025	
	Measured uranium concentration (µg/ml):	2.70E-01	2.86E-03	
	Uncertainty in uranium concentration (µg/ml):	2.70E-02	2.86E-04	
	Weight uranium leached (g):	1.40E-05	1.50E-07	1.42E-05
	Uncertainty in weight uranium leached (g):	1.41E-06	1.51E-08	1.42E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	5.92E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	3.08	< 2.16	< 5.24
	Weight of impurity in blank (µg):	< 2.15	< 2.10	
	Minimum corrected weight of impurity in sample (µg):	0.93	0.00	0.93
	Maximum corrected weight of impurity in sample (µg):	3.08	2.16	5.24
Cr	Measured concentration of impurity in sample (µg/ml):	2.01E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.05	< 0.11	< 1.15
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.94	0.00	0.94
	Maximum corrected weight of impurity in sample (µg):	1.05	0.11	1.15
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.10	< 0.20
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.10	0.20
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.09	< 0.17
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.09	0.17
Ni	Measured concentration of impurity in sample (µg/ml):	3.85E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	2.00	< 0.42	< 2.42
	Weight of impurity in blank (µg):	< 0.42	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	1.58	0.00	1.58
	Maximum corrected weight of impurity in sample (µg):	2.00	0.42	2.42
Ca	Measured concentration of impurity in sample (µg/ml):	3.19E+00	1.49E+00	**Ca**
	Uncorrected weight of impurity in sample (µg):	165.88	78.23	244.11
	Weight of impurity in blank (µg):	9.92	97.41	
	Minimum corrected weight of impurity in sample (µg):	155.96	0.00	155.96
	Maximum corrected weight of impurity in sample (µg):	155.96	0.00	155.96
Al	Measured concentration of impurity in sample (µg/ml):	1.52E+00	3.25E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	79.04	1.71	80.75
	Weight of impurity in blank (µg):	3.05	1.28	
	Minimum corrected weight of impurity in sample (µg):	75.99	0.43	76.42
	Maximum corrected weight of impurity in sample (µg):	75.99	0.43	76.42
Ti	Measured concentration of impurity in sample (µg/ml):	1.34E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	6.97	< 0.42	< 7.39
	Weight of impurity in blank (µg):	< 0.42	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	6.55	0.00	6.55
	Maximum corrected weight of impurity in sample (µg):	6.97	0.42	7.39
V	Measured concentration of impurity in sample (µg/ml):	1.03E+00	5.41E-03	**V**
	Uncorrected weight of impurity in sample (µg):	53.56	0.28	53.84
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	53.46	0.18	53.64
	Maximum corrected weight of impurity in sample (µg):	53.56	0.28	53.84

Comments

Data checked against RMAL 2157 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	Burn-Leach Blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_01.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09081402	B09081702	
	Number of compacts:	None		
	Total volume of leach solution (ml):	52.2	51.0	
	Radiochemical laboratory analysis number:	2157-017	2157-022	
	Measured uranium concentration (µg/ml):	<2.00E-04	<2.00E-04	
	Uncertainty in uranium concentration (µg/ml):			
	Weight uranium leached (g):	<1.04E-08	<1.02E-08	<2.06E-08
	Uncertainty in weight uranium leached (g):			
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:			
Fe	Measured concentration (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Total weight of leached impurity (µg):	< 2.15	< 2.10	< 4.25
Cr	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	**Cr**
	Total weight of leached impurity (µg):	< 0.10	< 0.10	< 0.21
Mn	Measured concentration (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Total weight of leached impurity (µg):	< 0.10	< 0.10	< 0.20
Co	Measured concentration (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Total weight of leached impurity (µg):	< 0.08	< 0.08	< 0.17
Ni	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Total weight of leached impurity (µg):	< 0.42	< 0.41	< 0.83
Ca	Measured concentration (µg/ml):	1.90E-01	1.91E+00	**Ca**
	Total weight of leached impurity (µg):	9.92	97.41	107.33
Al	Measured concentration (µg/ml):	5.85E-02	2.50E-02	**Al**
	Total weight of leached impurity (µg):	3.05	1.28	4.33
Ti	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	**Ti**
	Total weight of leached impurity (µg):	< 0.42	< 0.41	< 0.83
V	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	**V**
	Total weight of leached impurity (µg):	< 0.10	< 0.10	< 0.21

Comments

Data checked against RMAL 2157 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	051, 086, 143, 097, 033
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_02.xls

Mean average weight uranium per particle (g):	3.964E-04
Uncertainty in mean average weight uranium per particle (g):	8.1E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09081001	L09081201	
	Number of compacts:	5		
	Total volume of leach solution (ml):	133.0	128.0	
	Radiochemical laboratory analysis number:	2157-001	2157-006	
	Measured uranium concentration (µg/ml):	6.51E-02	6.17E-03	
	Uncertainty in uranium concentration (µg/ml):	6.51E-03	6.17E-04	
	Weight uranium leached (g):	8.66E-06	7.90E-07	9.45E-06
	Uncertainty in weight uranium leached (g):	8.67E-07	7.91E-08	8.70E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.48	< 5.27	<10.75
	Weight of impurity in blank (µg):	< 7.05	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.48	5.27	10.75
Cr	Measured concentration of impurity in sample (µg/ml):	5.64E-03	4.56E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.75	0.58	1.33
	Weight of impurity in blank (µg):	< 0.34	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.41	0.33	0.74
	Maximum corrected weight of impurity in sample (µg):	0.75	0.58	1.33
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.25	< 0.24	< 0.50
	Weight of impurity in blank (µg):	< 0.33	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.25	0.24	0.50
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.22	< 0.21	< 0.42
	Weight of impurity in blank (µg):	< 0.28	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.22	0.21	0.42
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 1.06	< 1.02	< 2.09
	Weight of impurity in blank (µg):	< 1.37	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	1.06	1.02	2.09
Ca	Measured concentration of impurity in sample (µg/ml):	6.58E-01	1.62E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	87.51	20.74	108.25
	Weight of impurity in blank (µg):	162.28	115.63	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
Al	Measured concentration of impurity in sample (µg/ml):	3.96E-01	5.63E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	52.67	7.21	59.87
	Weight of impurity in blank (µg):	3.10	1.07	
	Minimum corrected weight of impurity in sample (µg):	49.57	6.14	55.71
	Maximum corrected weight of impurity in sample (µg):	49.57	6.14	55.71
Ti	Measured concentration of impurity in sample (µg/ml):	2.33E-02	1.99E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	3.10	2.55	5.65
	Weight of impurity in blank (µg):	< 1.37	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	1.73	1.55	3.28
	Maximum corrected weight of impurity in sample (µg):	3.10	2.55	5.65
V	Measured concentration of impurity in sample (µg/ml):	2.19E-01	3.90E-02	**V**
	Uncorrected weight of impurity in sample (µg):	29.13	4.99	34.12
	Weight of impurity in blank (µg):	< 0.34	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	28.79	4.74	33.53
	Maximum corrected weight of impurity in sample (µg):	29.13	4.99	34.12

Comments

Data checked against RMAL 2157 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	030, 024, 090, 013, 010
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_02.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09081002	L09081202	
	Number of compacts:	5		
	Total volume of leach solution (ml):	138.0	128.0	
	Radiochemical laboratory analysis number:	2157-002	2157-007	
	Measured uranium concentration (µg/ml):	6.16E-02	6.89E-03	
	Uncertainty in uranium concentration (µg/ml):	6.16E-03	6.89E-04	
	Weight uranium leached (g):	8.50E-06	8.82E-07	9.38E-06
	Uncertainty in weight uranium leached (g):	8.51E-07	8.83E-08	8.56E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.69	< 5.27	<10.96
	Weight of impurity in blank (µg):	< 7.05	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.69	5.27	10.96
Cr	Measured concentration of impurity in sample (µg/ml):	8.42E-03	5.75E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.16	0.74	1.90
	Weight of impurity in blank (µg):	< 0.34	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.82	0.49	1.31
	Maximum corrected weight of impurity in sample (µg):	1.16	0.74	1.90
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.26	< 0.24	< 0.51
	Weight of impurity in blank (µg):	< 0.33	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.26	0.24	0.51
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.22	< 0.21	< 0.43
	Weight of impurity in blank (µg):	< 0.28	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.22	0.21	0.43
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 1.10	< 1.02	< 2.13
	Weight of impurity in blank (µg):	< 1.37	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	1.10	1.02	2.13
Ca	Measured concentration of impurity in sample (µg/ml):	2.03E+00	8.89E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	280.14	113.79	393.93
	Weight of impurity in blank (µg):	162.28	115.63	
	Minimum corrected weight of impurity in sample (µg):	117.86	0.00	117.86
	Maximum corrected weight of impurity in sample (µg):	117.86	0.00	117.86
Al	Measured concentration of impurity in sample (µg/ml):	4.65E-01	1.08E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	64.17	13.82	77.99
	Weight of impurity in blank (µg):	3.10	1.07	
	Minimum corrected weight of impurity in sample (µg):	61.07	12.75	73.83
	Maximum corrected weight of impurity in sample (µg):	61.07	12.75	73.83
Ti	Measured concentration of impurity in sample (µg/ml):	2.93E-02	2.18E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	4.04	2.79	6.83
	Weight of impurity in blank (µg):	< 1.37	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	2.68	1.79	4.47
	Maximum corrected weight of impurity in sample (µg):	4.04	2.79	6.83
V	Measured concentration of impurity in sample (µg/ml):	2.05E-01	3.33E-02	**V**
	Uncorrected weight of impurity in sample (µg):	28.29	4.26	32.55
	Weight of impurity in blank (µg):	< 0.34	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	27.95	4.01	31.96
	Maximum corrected weight of impurity in sample (µg):	28.29	4.26	32.55

Comments

Data checked against RMAL 2157 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	021, 035, 121, 107, 061
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_02.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09081003	L09081203	
	Number of compacts:	5		
	Total volume of leach solution (ml):	132.0	129.0	
	Radiochemical laboratory analysis number:	2157-003	2157-008	
	Measured uranium concentration (µg/ml):	2.56E+00	1.60E-01	
	Uncertainty in uranium concentration (µg/ml):	2.56E-01	1.60E-02	
	Weight uranium leached (g):	3.38E-04	2.06E-05	3.59E-04
	Uncertainty in weight uranium leached (g):	3.38E-05	2.07E-06	3.39E-05
	Effective number of exposed kernels:	0.9	0.1	0.9
	Uncertainty in effective number of exposed kernels:	0.1	0.0	0.1
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-01	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.44	<53.15	<58.59
	Weight of impurity in blank (µg):	< 7.05	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.44	53.15	58.59
Cr	Measured concentration of impurity in sample (µg/ml):	5.47E-03	2.92E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.72	0.38	1.10
	Weight of impurity in blank (µg):	< 0.34	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.38	0.13	0.51
	Maximum corrected weight of impurity in sample (µg):	0.72	0.38	1.10
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.25	< 0.25	< 0.50
	Weight of impurity in blank (µg):	< 0.33	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.25	0.25	0.50
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.21	< 0.21	< 0.42
	Weight of impurity in blank (µg):	< 0.28	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.21	0.21	0.42
Ni	Measured concentration of impurity in sample (µg/ml):	1.09E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	1.44	< 1.03	< 2.47
	Weight of impurity in blank (µg):	< 1.37	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.07	0.00	0.07
	Maximum corrected weight of impurity in sample (µg):	1.44	1.03	2.47
Ca	Measured concentration of impurity in sample (µg/ml):	1.27E+00	1.45E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	167.64	18.71	186.35
	Weight of impurity in blank (µg):	162.28	115.63	
	Minimum corrected weight of impurity in sample (µg):	5.36	0.00	5.36
	Maximum corrected weight of impurity in sample (µg):	5.36	0.00	5.36
Al	Measured concentration of impurity in sample (µg/ml):	4.06E-01	5.06E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	53.59	6.53	60.12
	Weight of impurity in blank (µg):	3.10	1.07	
	Minimum corrected weight of impurity in sample (µg):	50.50	5.46	55.95
	Maximum corrected weight of impurity in sample (µg):	50.50	5.46	55.95
Ti	Measured concentration of impurity in sample (µg/ml):	1.64E-02	1.44E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	2.16	1.86	4.02
	Weight of impurity in blank (µg):	< 1.37	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.80	0.86	1.65
	Maximum corrected weight of impurity in sample (µg):	2.16	1.86	4.02
V	Measured concentration of impurity in sample (µg/ml):	1.98E-01	4.43E-02	**V**
	Uncorrected weight of impurity in sample (µg):	26.14	5.71	31.85
	Weight of impurity in blank (µg):	< 0.34	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	25.79	5.46	31.26
	Maximum corrected weight of impurity in sample (µg):	26.14	5.71	31.85

Comments

Data checked against RMAL 2157 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	151, 003, 058, 080, 009
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_02.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
Deconsolidation-leach solution ID:		L09081005	L09081205	
Number of compacts:		5		
Total volume of leach solution (ml):		133.0	130.0	
Radiochemical laboratory analysis number:		2157-005	2157-010	
Measured uranium concentration (µg/ml):		6.08E-02	7.31E-03	
Uncertainty in uranium concentration (µg/ml):		6.08E-03	7.31E-04	
Weight uranium leached (g):		8.09E-06	9.50E-07	9.04E-06
Uncertainty in weight uranium leached (g):		8.10E-07	9.51E-08	8.15E-07
Effective number of exposed kernels:		0.0	0.0	0.0
Uncertainty in effective number of exposed kernels:		0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.48	< 5.36	<10.84
	Weight of impurity in blank (µg):	< 7.05	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.48	5.36	10.84
Cr	Measured concentration of impurity in sample (µg/ml):	3.35E-03	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.45	< 0.26	< 0.71
	Weight of impurity in blank (µg):	< 0.34	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.10	0.00	0.10
	Maximum corrected weight of impurity in sample (µg):	0.45	0.26	0.71
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.25	< 0.25	< 0.50
	Weight of impurity in blank (µg):	< 0.33	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.25	0.25	0.50
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.22	< 0.21	< 0.43
	Weight of impurity in blank (µg):	< 0.28	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.22	0.21	0.43
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 1.06	< 1.04	< 2.10
	Weight of impurity in blank (µg):	< 1.37	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	1.06	1.04	2.10
Ca	Measured concentration of impurity in sample (µg/ml):	3.28E+00	4.09E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	436.24	53.17	489.41
	Weight of impurity in blank (µg):	162.28	115.63	
	Minimum corrected weight of impurity in sample (µg):	273.96	0.00	273.96
	Maximum corrected weight of impurity in sample (µg):	273.96	0.00	273.96
Al	Measured concentration of impurity in sample (µg/ml):	3.66E-01	5.35E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	48.68	6.96	55.63
	Weight of impurity in blank (µg):	3.10	1.07	
	Minimum corrected weight of impurity in sample (µg):	45.58	5.88	51.47
	Maximum corrected weight of impurity in sample (µg):	45.58	5.88	51.47
Ti	Measured concentration of impurity in sample (µg/ml):	1.75E-02	2.02E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	2.33	2.63	4.95
	Weight of impurity in blank (µg):	< 1.37	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.96	1.63	2.59
	Maximum corrected weight of impurity in sample (µg):	2.33	2.63	4.95
V	Measured concentration of impurity in sample (µg/ml):	1.72E-01	5.56E-02	**V**
	Uncorrected weight of impurity in sample (µg):	22.88	7.23	30.10
	Weight of impurity in blank (µg):	< 0.34	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	22.53	6.98	29.51
	Maximum corrected weight of impurity in sample (µg):	22.88	7.23	30.10

Comments

Data checked against RMAL 2157 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	Deconsolidation Leach Blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_02.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09081004	L09081204	
	Number of compacts:	None		
	Total volume of leach solution (ml):	171.0	125.0	
	Radiochemical laboratory analysis number:	2157-004	2157-009	
	Measured uranium concentration (µg/ml):	2.36E-04	<2.00E-04	
	Uncertainty in uranium concentration (µg/ml):	2.36E-05		
	Weight uranium leached (g):	4.04E-08	<2.50E-08	<6.54E-08
	Uncertainty in weight uranium leached (g):	4.04E-09		
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0		
Fe	Measured concentration (µg/ml):	< 4.12E-02	< 4.12E-02	Fe
	Total weight of leached impurity (µg):	< 7.05	< 5.15	<12.20
Cr	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	Cr
	Total weight of leached impurity (µg):	< 0.34	< 0.25	< 0.59
Mn	Measured concentration (µg/ml):	< 1.91E-03	< 1.91E-03	Mn
	Total weight of leached impurity (µg):	< 0.33	< 0.24	< 0.57
Co	Measured concentration (µg/ml):	< 1.62E-03	< 1.62E-03	Co
	Total weight of leached impurity (µg):	< 0.28	< 0.20	< 0.48
Ni	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	Ni
	Total weight of leached impurity (µg):	< 1.37	< 1.00	< 2.37
Ca	Measured concentration (µg/ml):	9.49E-01	9.25E-01	Ca
	Total weight of leached impurity (µg):	162.28	115.63	277.90
Al	Measured concentration (µg/ml):	1.81E-02	8.57E-03	Al
	Total weight of leached impurity (µg):	3.10	1.07	4.17
Ti	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	Ti
	Total weight of leached impurity (µg):	< 1.37	< 1.00	< 2.37
V	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	V
	Total weight of leached impurity (µg):	< 0.34	< 0.25	< 0.59

Comments

Data checked against RMAL 2157 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	051, 086, 143, 097, 033
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_02.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09082101	B09082401	
	Number of compacts:	5		
	Total volume of leach solution (ml):	49.0	52.5	
	Radiochemical laboratory analysis number:	2191-001	2191-006	
	Measured uranium concentration (µg/ml):	8.82E-01	5.21E-01	
	Uncertainty in uranium concentration (µg/ml):	8.82E-02	5.21E-02	
	Weight uranium leached (g):	4.32E-05	2.74E-05	7.06E-05
	Uncertainty in weight uranium leached (g):	4.36E-06	2.76E-06	5.16E-06
	Number of leached kernels:	0.1	0.1	0.2
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	6.59E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	3.23	< 2.16	< 5.39
	Weight of impurity in blank (µg):	< 2.12	< 2.13	
	Minimum corrected weight of impurity in sample (µg):	1.11	0.00	1.11
	Maximum corrected weight of impurity in sample (µg):	3.23	2.16	5.39
Cr	Measured concentration of impurity in sample (µg/ml):	2.33E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.14	< 0.11	< 1.25
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	1.04	0.00	1.04
	Maximum corrected weight of impurity in sample (µg):	1.14	0.11	1.25
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.09	< 0.10	< 0.19
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.09	0.10	0.19
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.09	< 0.16
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.09	0.16
Ni	Measured concentration of impurity in sample (µg/ml):	5.19E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	2.54	< 0.42	< 2.96
	Weight of impurity in blank (µg):	< 0.41	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	2.13	0.00	2.13
	Maximum corrected weight of impurity in sample (µg):	2.54	0.42	2.96
Ca	Measured concentration of impurity in sample (µg/ml):	2.18E+00	4.56E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	106.82	23.94	130.76
	Weight of impurity in blank (µg):	11.33	< 5.18	
	Minimum corrected weight of impurity in sample (µg):	95.49	18.76	114.25
	Maximum corrected weight of impurity in sample (µg):	95.49	23.94	119.43
Al	Measured concentration of impurity in sample (µg/ml):	1.70E+00	4.80E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	83.30	2.52	85.82
	Weight of impurity in blank (µg):	2.80	0.60	
	Minimum corrected weight of impurity in sample (µg):	80.50	1.92	82.43
	Maximum corrected weight of impurity in sample (µg):	80.50	1.92	82.43
Ti	Measured concentration of impurity in sample (µg/ml):	1.60E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	7.84	< 0.42	< 8.26
	Weight of impurity in blank (µg):	< 0.41	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	7.43	0.00	7.43
	Maximum corrected weight of impurity in sample (µg):	7.84	0.42	8.26
V	Measured concentration of impurity in sample (µg/ml):	1.18E+00	1.07E-02	**V**
	Uncorrected weight of impurity in sample (µg):	57.82	0.56	58.38
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	57.72	0.46	58.18
	Maximum corrected weight of impurity in sample (µg):	57.82	0.56	58.38

Comments

Data checked against RMAL 2191 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	030, 024, 090, 013, 010
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_02.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09082102	B09082402	
	Number of compacts:	5		
	Total volume of leach solution (ml):	49.8	51.8	
	Radiochemical laboratory analysis number:	2191-002	2191-007	
	Measured uranium concentration (µg/ml):	3.32E-01	4.37E-03	
	Uncertainty in uranium concentration (µg/ml):	3.32E-02	4.37E-04	
	Weight uranium leached (g):	1.65E-05	2.26E-07	1.68E-05
	Uncertainty in weight uranium leached (g):	1.67E-06	2.28E-08	1.67E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	1.00E-01	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	4.98	< 2.13	< 7.11
	Weight of impurity in blank (µg):	< 2.12	< 2.13	
	Minimum corrected weight of impurity in sample (µg):	2.86	0.00	2.86
	Maximum corrected weight of impurity in sample (µg):	4.98	2.13	7.11
Cr	Measured concentration of impurity in sample (µg/ml):	2.38E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.19	< 0.10	< 1.29
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	1.08	0.00	1.08
	Maximum corrected weight of impurity in sample (µg):	1.19	0.10	1.29
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.10	< 0.19
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.10	0.19
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.08	< 0.16
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.08	0.16
Ni	Measured concentration of impurity in sample (µg/ml):	4.21E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	2.10	< 0.41	< 2.51
	Weight of impurity in blank (µg):	< 0.41	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	1.68	0.00	1.68
	Maximum corrected weight of impurity in sample (µg):	2.10	0.41	2.51
Ca	Measured concentration of impurity in sample (µg/ml):	2.05E+00	1.42E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	102.09	7.36	109.45
	Weight of impurity in blank (µg):	11.33	< 5.18	
	Minimum corrected weight of impurity in sample (µg):	90.76	2.18	92.94
	Maximum corrected weight of impurity in sample (µg):	90.76	7.36	98.12
Al	Measured concentration of impurity in sample (µg/ml):	1.83E+00	5.05E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	91.13	2.62	93.75
	Weight of impurity in blank (µg):	2.80	0.60	
	Minimum corrected weight of impurity in sample (µg):	88.34	2.02	90.36
	Maximum corrected weight of impurity in sample (µg):	88.34	2.02	90.36
Ti	Measured concentration of impurity in sample (µg/ml):	1.42E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	7.07	< 0.41	< 7.49
	Weight of impurity in blank (µg):	< 0.41	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	6.66	0.00	6.66
	Maximum corrected weight of impurity in sample (µg):	7.07	0.41	7.49
V	Measured concentration of impurity in sample (µg/ml):	2.27E-01	7.07E-03	**V**
	Uncorrected weight of impurity in sample (µg):	11.30	0.37	11.67
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	11.20	0.26	11.46
	Maximum corrected weight of impurity in sample (µg):	11.30	0.37	11.67

Comments

Data checked against RMAL 2191 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	021, 035, 121, 107, 061
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_02.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09082103	B09082403	
	Number of compacts:	5		
	Total volume of leach solution (ml):	50.0	50.0	
	Radiochemical laboratory analysis number:	2191-003	2191-008	
	Measured uranium concentration (µg/ml):	3.56E-01	2.86E-01	
	Uncertainty in uranium concentration (µg/ml):	3.56E-02	2.86E-02	
	Weight uranium leached (g):	1.78E-05	1.43E-05	3.21E-05
	Uncertainty in weight uranium leached (g):	1.79E-06	1.44E-06	2.30E-06
	Number of leached kernels:	0.0	0.0	0.1
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	6.32E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	3.16	< 2.06	< 5.22
	Weight of impurity in blank (µg):	< 2.12	< 2.13	
	Minimum corrected weight of impurity in sample (µg):	1.04	0.00	1.04
	Maximum corrected weight of impurity in sample (µg):	3.16	2.06	5.22
Cr	Measured concentration of impurity in sample (µg/ml):	2.15E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.08	< 0.10	< 1.18
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.97	0.00	0.97
	Maximum corrected weight of impurity in sample (µg):	1.08	0.10	1.18
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.10	< 0.19
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.10	0.19
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.08	< 0.16
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.08	0.16
Ni	Measured concentration of impurity in sample (µg/ml):	5.54E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	2.77	< 0.40	< 3.17
	Weight of impurity in blank (µg):	< 0.41	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	2.36	0.00	2.36
	Maximum corrected weight of impurity in sample (µg):	2.77	0.40	3.17
Ca	Measured concentration of impurity in sample (µg/ml):	2.00E+00	1.25E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	100.00	6.25	106.25
	Weight of impurity in blank (µg):	11.33	< 5.18	
	Minimum corrected weight of impurity in sample (µg):	88.67	1.07	89.74
	Maximum corrected weight of impurity in sample (µg):	88.67	6.25	94.92
Al	Measured concentration of impurity in sample (µg/ml):	1.63E+00	7.89E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	81.50	3.95	85.45
	Weight of impurity in blank (µg):	2.80	0.60	
	Minimum corrected weight of impurity in sample (µg):	78.70	3.35	82.05
	Maximum corrected weight of impurity in sample (µg):	78.70	3.35	82.05
Ti	Measured concentration of impurity in sample (µg/ml):	1.70E-01	1.22E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	8.50	0.61	9.11
	Weight of impurity in blank (µg):	< 0.41	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	8.09	0.20	8.28
	Maximum corrected weight of impurity in sample (µg):	8.50	0.61	9.11
V	Measured concentration of impurity in sample (µg/ml):	1.14E+00	1.17E-02	**V**
	Uncorrected weight of impurity in sample (µg):	57.00	0.59	57.59
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	56.90	0.48	57.38
	Maximum corrected weight of impurity in sample (µg):	57.00	0.59	57.59

Comments

Data checked against RMAL 2191 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	151, 003, 058, 080, 009
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_02.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09082105	B09082405	
	Number of compacts:	5		
	Total volume of leach solution (ml):	49.8	52.8	
	Radiochemical laboratory analysis number:	2191-005	2191-010	
	Measured uranium concentration (µg/ml):	3.32E-01	6.60E-03	
	Uncertainty in uranium concentration (µg/ml):	3.32E-02	6.60E-04	
	Weight uranium leached (g):	1.65E-05	3.48E-07	1.69E-05
	Uncertainty in weight uranium leached (g):	1.67E-06	3.51E-08	1.67E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	6.84E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	3.41	< 2.18	< 5.58
	Weight of impurity in blank (µg):	< 2.12	< 2.13	
	Minimum corrected weight of impurity in sample (µg):	1.28	0.00	1.28
	Maximum corrected weight of impurity in sample (µg):	3.41	2.18	5.58
Cr	Measured concentration of impurity in sample (µg/ml):	2.36E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.18	< 0.11	< 1.28
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	1.07	0.00	1.07
	Maximum corrected weight of impurity in sample (µg):	1.18	0.11	1.28
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.10	< 0.20
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.10	0.20
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.09	< 0.17
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.09	0.17
Ni	Measured concentration of impurity in sample (µg/ml):	6.38E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	3.18	< 0.42	< 3.60
	Weight of impurity in blank (µg):	< 0.41	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	2.77	0.00	2.77
	Maximum corrected weight of impurity in sample (µg):	3.18	0.42	3.60
Ca	Measured concentration of impurity in sample (µg/ml):	2.10E+00	1.95E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	104.58	10.30	114.88
	Weight of impurity in blank (µg):	11.33	< 5.18	
	Minimum corrected weight of impurity in sample (µg):	93.25	5.12	98.37
	Maximum corrected weight of impurity in sample (µg):	93.25	10.30	103.55
Al	Measured concentration of impurity in sample (µg/ml):	1.69E+00	6.68E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	84.16	3.53	87.69
	Weight of impurity in blank (µg):	2.80	0.60	
	Minimum corrected weight of impurity in sample (µg):	81.37	2.93	84.30
	Maximum corrected weight of impurity in sample (µg):	81.37	2.93	84.30
Ti	Measured concentration of impurity in sample (µg/ml):	1.80E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	8.96	< 0.42	< 9.39
	Weight of impurity in blank (µg):	< 0.41	< 0.41	
	Minimum corrected weight of impurity in sample (µg):	8.55	0.00	8.55
	Maximum corrected weight of impurity in sample (µg):	8.96	0.42	9.39
V	Measured concentration of impurity in sample (µg/ml):	1.17E+00	1.10E-02	**V**
	Uncorrected weight of impurity in sample (µg):	58.27	0.58	58.85
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	58.16	0.48	58.64
	Maximum corrected weight of impurity in sample (µg):	58.27	0.58	58.85

Comments

Data checked against RMAL 2191 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	Burn-Leach Blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_02.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09082104	B09082404	
	Number of compacts:	None		
	Total volume of leach solution (ml):	51.5	51.8	
	Radiochemical laboratory analysis number:	2191-004	2191-009	
	Measured uranium concentration (µg/ml):	<2.00E-04	2.28E-04	
	Uncertainty in uranium concentration (µg/ml):		2.28E-05	
	Weight uranium leached (g):	<1.03E-08	1.18E-08	<2.21E-08
	Uncertainty in weight uranium leached (g):		1.19E-09	
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:		0.0	
Fe	Measured concentration (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Total weight of leached impurity (µg):	< 2.12	< 2.13	< 4.26
Cr	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	**Cr**
	Total weight of leached impurity (µg):	< 0.10	< 0.10	< 0.21
Mn	Measured concentration (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Total weight of leached impurity (µg):	< 0.10	< 0.10	< 0.20
Co	Measured concentration (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Total weight of leached impurity (µg):	< 0.08	< 0.08	< 0.17
Ni	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Total weight of leached impurity (µg):	< 0.41	< 0.41	< 0.83
Ca	Measured concentration (µg/ml):	2.20E-01	< 1.00E-01	**Ca**
	Total weight of leached impurity (µg):	11.33	< 5.18	<16.51
Al	Measured concentration (µg/ml):	5.43E-02	1.15E-02	**Al**
	Total weight of leached impurity (µg):	2.80	0.60	3.39
Ti	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	**Ti**
	Total weight of leached impurity (µg):	< 0.41	< 0.41	< 0.83
V	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	**V**
	Total weight of leached impurity (µg):	< 0.10	< 0.10	< 0.21

Comments

Data checked against RMAL 2191 official results of analyses by FCM on 10/14/2009

Fred C. Montgomery
Operator

1-22-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	118, 041, 138, 007, 071
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_03.xls

Mean average weight uranium per particle (g):	3.964E-04
Uncertainty in mean average weight uranium per particle (g):	8.1E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09111001	L09111601	
	Number of compacts:	5		
	Total volume of leach solution (ml):	117.0	117.0	
	Radiochemical laboratory analysis number:	2392-001	2392-006	
	Measured uranium concentration (µg/ml):	5.57E-02	8.48E-03	
	Uncertainty in uranium concentration (µg/ml):	5.57E-03	8.48E-04	
	Weight uranium leached (g):	6.52E-06	9.92E-07	7.51E-06
	Uncertainty in weight uranium leached (g):	6.53E-07	9.94E-08	6.60E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 4.82	< 4.82	< 9.64
	Weight of impurity in blank (µg):	< 6.10	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	4.82	4.82	9.64
Cr	Measured concentration of impurity in sample (µg/ml):	1.08E-02	6.08E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.26	0.71	1.97
	Weight of impurity in blank (µg):	0.80	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.46	0.46	0.92
	Maximum corrected weight of impurity in sample (µg):	0.46	0.71	1.17
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.22	< 0.22	< 0.45
	Weight of impurity in blank (µg):	< 0.28	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.22	0.22	0.45
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.19	< 0.19	< 0.38
	Weight of impurity in blank (µg):	< 0.24	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.19	0.19	0.38
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 0.94	< 0.94	< 1.87
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.94	0.94	1.87
Ca	Measured concentration of impurity in sample (µg/ml):	5.02E-01	7.86E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	58.73	91.96	150.70
	Weight of impurity in blank (µg):	37.00	<12.50	
	Minimum corrected weight of impurity in sample (µg):	21.73	79.46	101.20
	Maximum corrected weight of impurity in sample (µg):	21.73	91.96	113.70
Al	Measured concentration of impurity in sample (µg/ml):	5.24E-01	1.38E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	61.31	16.15	77.45
	Weight of impurity in blank (µg):	7.73	1.41	
	Minimum corrected weight of impurity in sample (µg):	53.58	14.73	68.32
	Maximum corrected weight of impurity in sample (µg):	53.58	14.73	68.32
Ti	Measured concentration of impurity in sample (µg/ml):	3.50E-02	3.32E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	4.10	3.88	7.98
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	2.91	2.88	5.80
	Maximum corrected weight of impurity in sample (µg):	4.10	3.88	7.98
V	Measured concentration of impurity in sample (µg/ml):	2.34E-01	5.16E-02	**V**
	Uncorrected weight of impurity in sample (µg):	27.38	6.04	33.42
	Weight of impurity in blank (µg):	< 0.30	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	27.08	5.79	32.87
	Maximum corrected weight of impurity in sample (µg):	27.38	6.04	33.42

Comments

Data checked against RMAL 2392 official results of analyses by FCM on 12/03/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	144, 048, 023, 037, 047
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_03.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09111002	L09111602	
	Number of compacts:	5		
	Total volume of leach solution (ml):	124.0	129.0	
	Radiochemical laboratory analysis number:	2392-002	2392-007	
	Measured uranium concentration (µg/ml):	5.59E-02	7.19E-03	
	Uncertainty in uranium concentration (µg/ml):	5.59E-03	7.19E-04	
	Weight uranium leached (g):	6.93E-06	9.28E-07	7.86E-06
	Uncertainty in weight uranium leached (g):	6.94E-07	9.29E-08	7.00E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	4.68E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	5.80	< 5.31	<11.12
	Weight of impurity in blank (µg):	< 6.10	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.80	5.31	11.12
Cr	Measured concentration of impurity in sample (µg/ml):	1.53E-02	5.24E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.90	0.68	2.57
	Weight of impurity in blank (µg):	0.80	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	1.09	0.43	1.52
	Maximum corrected weight of impurity in sample (µg):	1.09	0.68	1.77
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.24	< 0.25	< 0.48
	Weight of impurity in blank (µg):	< 0.28	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.24	0.25	0.48
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.20	< 0.21	< 0.41
	Weight of impurity in blank (µg):	< 0.24	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.20	0.21	0.41
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 0.99	< 1.03	< 2.02
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.99	1.03	2.02
Ca	Measured concentration of impurity in sample (µg/ml):	3.67E-01	4.10E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	45.51	52.89	98.40
	Weight of impurity in blank (µg):	37.00	<12.50	
	Minimum corrected weight of impurity in sample (µg):	8.51	40.39	48.90
	Maximum corrected weight of impurity in sample (µg):	8.51	52.89	61.40
Al	Measured concentration of impurity in sample (µg/ml):	4.82E-01	1.07E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	59.77	13.80	73.57
	Weight of impurity in blank (µg):	7.73	1.41	
	Minimum corrected weight of impurity in sample (µg):	52.04	12.39	64.43
	Maximum corrected weight of impurity in sample (µg):	52.04	12.39	64.43
Ti	Measured concentration of impurity in sample (µg/ml):	3.18E-02	2.47E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	3.94	3.19	7.13
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	2.76	2.19	4.95
	Maximum corrected weight of impurity in sample (µg):	3.94	3.19	7.13
V	Measured concentration of impurity in sample (µg/ml):	2.42E-01	4.55E-02	**V**
	Uncorrected weight of impurity in sample (µg):	30.01	5.87	35.88
	Weight of impurity in blank (µg):	< 0.30	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	29.71	5.62	35.33
	Maximum corrected weight of impurity in sample (µg):	30.01	5.87	35.88

Comments

Data checked against RMAL 2392 official results of analyses by FCM on 12/03/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	150, 065, 116, 140, 160
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_03.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09111004	L09111604	
	Number of compacts:	5		
	Total volume of leach solution (ml):	130.0	131.0	
	Radiochemical laboratory analysis number:	2392-004	2392-009	
	Measured uranium concentration (µg/ml):	2.46E+00	1.06E-01	
	Uncertainty in uranium concentration (µg/ml):	2.46E-01	1.06E-02	
	Weight uranium leached (g):	3.20E-04	1.39E-05	3.34E-04
	Uncertainty in weight uranium leached (g):	3.20E-05	1.39E-06	3.21E-05
	Effective number of exposed kernels:	0.8	0.0	0.8
	Uncertainty in effective number of exposed kernels:	0.1	0.0	0.1
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.36	< 5.40	<10.75
	Weight of impurity in blank (µg):	< 6.10	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.36	5.40	10.75
Cr	Measured concentration of impurity in sample (µg/ml):	1.15E-02	5.92E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.50	0.78	2.27
	Weight of impurity in blank (µg):	0.80	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.69	0.53	1.22
	Maximum corrected weight of impurity in sample (µg):	0.69	0.78	1.47
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.25	< 0.25	< 0.50
	Weight of impurity in blank (µg):	< 0.28	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.25	0.25	0.50
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.21	< 0.21	< 0.42
	Weight of impurity in blank (µg):	< 0.24	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.21	0.21	0.42
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 1.04	< 1.05	< 2.09
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	1.04	1.05	2.09
Ca	Measured concentration of impurity in sample (µg/ml):	6.17E-01	1.66E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	80.21	21.75	101.96
	Weight of impurity in blank (µg):	37.00	<12.50	
	Minimum corrected weight of impurity in sample (µg):	43.21	9.25	52.46
	Maximum corrected weight of impurity in sample (µg):	43.21	21.75	64.96
Al	Measured concentration of impurity in sample (µg/ml):	4.92E-01	1.19E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	63.96	15.59	79.55
	Weight of impurity in blank (µg):	7.73	1.41	
	Minimum corrected weight of impurity in sample (µg):	56.23	14.18	70.41
	Maximum corrected weight of impurity in sample (µg):	56.23	14.18	70.41
Ti	Measured concentration of impurity in sample (µg/ml):	4.16E-02	2.62E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	5.41	3.43	8.84
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	4.22	2.43	6.66
	Maximum corrected weight of impurity in sample (µg):	5.41	3.43	8.84
V	Measured concentration of impurity in sample (µg/ml):	2.28E-01	4.34E-02	**V**
	Uncorrected weight of impurity in sample (µg):	29.64	5.69	35.33
	Weight of impurity in blank (µg):	< 0.30	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	29.34	5.44	34.78
	Maximum corrected weight of impurity in sample (µg):	29.64	5.69	35.33

Comments

Data checked against RMAL 2392 official results of analyses by FCM on 12/03/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	034, 084, 074, 159, 060
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_03.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09111005	L09111605	
	Number of compacts:	5		
	Total volume of leach solution (ml):	128.0	122.0	
	Radiochemical laboratory analysis number:	2392-005	2392-010	
	Measured uranium concentration (µg/ml):	5.39E-02	8.57E-03	
	Uncertainty in uranium concentration (µg/ml):	5.39E-03	8.57E-04	
	Weight uranium leached (g):	6.90E-06	1.05E-06	7.94E-06
	Uncertainty in weight uranium leached (g):	6.91E-07	1.05E-07	6.99E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.27	< 5.03	<10.30
	Weight of impurity in blank (µg):	< 6.10	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.27	5.03	10.30
Cr	Measured concentration of impurity in sample (µg/ml):	1.26E-02	5.21E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.61	0.64	2.25
	Weight of impurity in blank (µg):	0.80	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.81	0.39	1.19
	Maximum corrected weight of impurity in sample (µg):	0.81	0.64	1.44
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.24	< 0.23	< 0.48
	Weight of impurity in blank (µg):	< 0.28	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.24	0.23	0.48
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.21	< 0.20	< 0.41
	Weight of impurity in blank (µg):	< 0.24	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.21	0.20	0.41
Ni	Measured concentration of impurity in sample (µg/ml):	8.02E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	1.03	< 0.98	< 2.00
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	1.03	0.98	2.00
Ca	Measured concentration of impurity in sample (µg/ml):	1.05E+00	7.33E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	134.40	89.43	223.83
	Weight of impurity in blank (µg):	37.00	<12.50	
	Minimum corrected weight of impurity in sample (µg):	97.40	76.93	174.33
	Maximum corrected weight of impurity in sample (µg):	97.40	89.43	186.83
Al	Measured concentration of impurity in sample (µg/ml):	5.24E-01	1.36E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	67.07	16.59	83.66
	Weight of impurity in blank (µg):	7.73	1.41	
	Minimum corrected weight of impurity in sample (µg):	59.35	15.18	74.53
	Maximum corrected weight of impurity in sample (µg):	59.35	15.18	74.53
Ti	Measured concentration of impurity in sample (µg/ml):	5.38E-02	3.05E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	6.89	3.72	10.61
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	5.70	2.72	8.42
	Maximum corrected weight of impurity in sample (µg):	6.89	3.72	10.61
V	Measured concentration of impurity in sample (µg/ml):	2.54E-01	4.76E-02	**V**
	Uncorrected weight of impurity in sample (µg):	32.51	5.81	38.32
	Weight of impurity in blank (µg):	< 0.30	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	32.22	5.56	37.77
	Maximum corrected weight of impurity in sample (µg):	32.51	5.81	38.32

Comments

Data checked against RMAL 2392 official results of analyses by FCM on 12/03/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	Deconsolidation Leach Blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_03.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09111003	L09111603	
	Number of compacts:	None		
	Total volume of leach solution (ml):	148.0	125.0	
	Radiochemical laboratory analysis number:	2392-003	2392-008	
	Measured uranium concentration (µg/ml):	3.96E-04	<2.00E-04	
	Uncertainty in uranium concentration (µg/ml):	3.96E-05		
	Weight uranium leached (g):	5.86E-08	<2.50E-08	<8.36E-08
	Uncertainty in weight uranium leached (g):	5.87E-09		
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0		
Fe	Measured concentration (µg/ml):	< 4.12E-02	< 4.12E-02	Fe
	Total weight of leached impurity (µg):	< 6.10	< 5.15	<11.25
Cr	Measured concentration (µg/ml):	5.43E-03	< 2.00E-03	Cr
	Total weight of leached impurity (µg):	0.80	< 0.25	< 1.05
Mn	Measured concentration (µg/ml):	< 1.91E-03	< 1.91E-03	Mn
	Total weight of leached impurity (µg):	< 0.28	< 0.24	< 0.52
Co	Measured concentration (µg/ml):	< 1.62E-03	< 1.62E-03	Co
	Total weight of leached impurity (µg):	< 0.24	< 0.20	< 0.44
Ni	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	Ni
	Total weight of leached impurity (µg):	< 1.18	< 1.00	< 2.18
Ca	Measured concentration (µg/ml):	2.50E-01	< 1.00E-01	Ca
	Total weight of leached impurity (µg):	37.00	<12.50	<49.50
Al	Measured concentration (µg/ml):	5.22E-02	1.13E-02	Al
	Total weight of leached impurity (µg):	7.73	1.41	9.14
Ti	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	Ti
	Total weight of leached impurity (µg):	< 1.18	< 1.00	< 2.18
V	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	V
	Total weight of leached impurity (µg):	< 0.30	< 0.25	< 0.55

Comments

Data checked against RMAL 2392 official results of analyses by FCM on 12/03/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	050, 044, 020, 164, 098
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_04.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09112001	L09112401	
	Number of compacts:	5		
	Total volume of leach solution (ml):	126.0	128.0	
	Radiochemical laboratory analysis number:	2419-001	2419-006	
	Measured uranium concentration (µg/ml):	6.91E-02	1.25E-02	
	Uncertainty in uranium concentration (µg/ml):	6.91E-03	1.25E-03	
	Weight uranium leached (g):	8.71E-06	1.60E-06	1.03E-05
	Uncertainty in weight uranium leached (g):	8.72E-07	1.60E-07	8.86E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.19	< 5.27	<10.46
	Weight of impurity in blank (µg):	< 6.06	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.19	5.27	10.46
Cr	Measured concentration of impurity in sample (µg/ml):	4.10E-03	9.74E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.52	1.25	1.76
	Weight of impurity in blank (µg):	< 0.29	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.22	1.00	1.22
	Maximum corrected weight of impurity in sample (µg):	0.52	1.25	1.76
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.24	< 0.24	< 0.49
	Weight of impurity in blank (µg):	< 0.28	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.24	0.24	0.49
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.20	< 0.21	< 0.41
	Weight of impurity in blank (µg):	< 0.24	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.20	0.21	0.41
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 1.01	< 1.02	< 2.03
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	1.01	1.02	2.03
Ca	Measured concentration of impurity in sample (µg/ml):	9.12E-01	9.24E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	114.91	118.27	233.18
	Weight of impurity in blank (µg):	26.31	125.00	
	Minimum corrected weight of impurity in sample (µg):	88.60	0.00	88.60
	Maximum corrected weight of impurity in sample (µg):	88.60	0.00	88.60
Al	Measured concentration of impurity in sample (µg/ml):	3.81E-01	1.51E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	48.01	19.33	67.33
	Weight of impurity in blank (µg):	1.69	2.19	
	Minimum corrected weight of impurity in sample (µg):	46.32	17.14	63.46
	Maximum corrected weight of impurity in sample (µg):	46.32	17.14	63.46
Ti	Measured concentration of impurity in sample (µg/ml):	1.62E-02	3.30E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	2.04	4.22	6.27
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.87	3.22	4.09
	Maximum corrected weight of impurity in sample (µg):	2.04	4.22	6.27
V	Measured concentration of impurity in sample (µg/ml):	1.71E-01	6.37E-02	**V**
	Uncorrected weight of impurity in sample (µg):	21.55	8.15	29.70
	Weight of impurity in blank (µg):	< 0.29	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	21.25	7.90	29.16
	Maximum corrected weight of impurity in sample (µg):	21.55	8.15	29.70

Comments

Data checked against RMAL 2419 official results of analyses by FCM on 12/09/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	027, 157, 054, 109, 070
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_04.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09112002	L09112402	
	Number of compacts:	5		
	Total volume of leach solution (ml):	121.0	123.0	
	Radiochemical laboratory analysis number:	2419-002	2419-007	
	Measured uranium concentration (µg/ml):	2.83E+00	1.59E-01	
	Uncertainty in uranium concentration (µg/ml):	2.83E-01	1.59E-02	
	Weight uranium leached (g):	3.42E-04	1.96E-05	3.62E-04
	Uncertainty in weight uranium leached (g):	3.43E-05	1.96E-06	3.43E-05
	Effective number of exposed kernels:	0.9	0.0	0.9
	Uncertainty in effective number of exposed kernels:	0.1	0.0	0.1
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 4.99	< 5.07	<10.05
	Weight of impurity in blank (µg):	< 6.06	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	4.99	5.07	10.05
Cr	Measured concentration of impurity in sample (µg/ml):	9.84E-03	7.38E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.19	0.91	2.10
	Weight of impurity in blank (µg):	< 0.29	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.90	0.66	1.55
	Maximum corrected weight of impurity in sample (µg):	1.19	0.91	2.10
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.23	< 0.23	< 0.47
	Weight of impurity in blank (µg):	< 0.28	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.23	0.23	0.47
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.20	< 0.20	< 0.40
	Weight of impurity in blank (µg):	< 0.24	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.20	0.20	0.40
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 0.97	< 0.98	< 1.95
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.97	0.98	1.95
Ca	Measured concentration of impurity in sample (µg/ml):	9.23E-01	8.32E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	111.68	102.34	214.02
	Weight of impurity in blank (µg):	26.31	125.00	
	Minimum corrected weight of impurity in sample (µg):	85.37	0.00	85.37
	Maximum corrected weight of impurity in sample (µg):	85.37	0.00	85.37
Al	Measured concentration of impurity in sample (µg/ml):	4.38E-01	1.65E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	53.00	20.30	73.29
	Weight of impurity in blank (µg):	1.69	2.19	
	Minimum corrected weight of impurity in sample (µg):	51.31	18.11	69.42
	Maximum corrected weight of impurity in sample (µg):	51.31	18.11	69.42
Ti	Measured concentration of impurity in sample (µg/ml):	2.66E-02	3.30E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	3.22	4.06	7.28
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	2.04	3.06	5.10
	Maximum corrected weight of impurity in sample (µg):	3.22	4.06	7.28
V	Measured concentration of impurity in sample (µg/ml):	2.22E-01	5.68E-02	**V**
	Uncorrected weight of impurity in sample (µg):	26.86	6.99	33.85
	Weight of impurity in blank (µg):	< 0.29	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	26.57	6.74	33.30
	Maximum corrected weight of impurity in sample (µg):	26.86	6.99	33.85

Comments

Data checked against RMAL 2419 official results of analyses by FCM on 12/09/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	025, 106, 133, 110, 029
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_04.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
Deconsolidation-leach solution ID:		L09112003	L09112403	
Number of compacts:		5		
Total volume of leach solution (ml):		127.0	127.0	
Radiochemical laboratory analysis number:		2419-003	2419-008	
Measured uranium concentration (µg/ml):		6.42E-02	1.02E-02	
Uncertainty in uranium concentration (µg/ml):		6.42E-03	1.02E-03	
Weight uranium leached (g):		8.15E-06	1.30E-06	9.45E-06
Uncertainty in weight uranium leached (g):		8.16E-07	1.30E-07	8.27E-07
Effective number of exposed kernels:		0.0	0.0	0.0
Uncertainty in effective number of exposed kernels:		0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.23	< 5.23	<10.46
	Weight of impurity in blank (µg):	< 6.06	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.23	5.23	10.46
Cr	Measured concentration of impurity in sample (µg/ml):	3.96E-03	8.08E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.50	1.03	1.53
	Weight of impurity in blank (µg):	< 0.29	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.21	0.78	0.99
	Maximum corrected weight of impurity in sample (µg):	0.50	1.03	1.53
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.24	< 0.24	< 0.49
	Weight of impurity in blank (µg):	< 0.28	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.24	0.24	0.49
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.21	< 0.21	< 0.41
	Weight of impurity in blank (µg):	< 0.24	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.21	0.21	0.41
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 1.02	< 1.02	< 2.03
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	1.02	1.02	2.03
Ca	Measured concentration of impurity in sample (µg/ml):	9.58E-01	< 1.00E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	121.67	<12.70	<134.37
	Weight of impurity in blank (µg):	26.31	125.00	
	Minimum corrected weight of impurity in sample (µg):	95.35	0.00	95.35
	Maximum corrected weight of impurity in sample (µg):	95.35	0.00	95.35
Al	Measured concentration of impurity in sample (µg/ml):	3.21E-01	1.08E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	40.77	13.72	54.48
	Weight of impurity in blank (µg):	1.69	2.19	
	Minimum corrected weight of impurity in sample (µg):	39.08	11.53	50.61
	Maximum corrected weight of impurity in sample (µg):	39.08	11.53	50.61
Ti	Measured concentration of impurity in sample (µg/ml):	1.80E-02	3.47E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	2.29	4.41	6.69
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	1.11	3.41	4.52
	Maximum corrected weight of impurity in sample (µg):	2.29	4.41	6.69
V	Measured concentration of impurity in sample (µg/ml):	1.58E-01	5.49E-02	**V**
	Uncorrected weight of impurity in sample (µg):	20.07	6.97	27.04
	Weight of impurity in blank (µg):	< 0.29	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	19.77	6.72	26.49
	Maximum corrected weight of impurity in sample (µg):	20.07	6.97	27.04

Comments

Data checked against RMAL 2419 official results of analyses by FCM on 12/09/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	113, 162, 055, 137, 123
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_04.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09112004	L09112404	
	Number of compacts:	5		
	Total volume of leach solution (ml):	123.0	131.0	
	Radiochemical laboratory analysis number:	2419-004	2419-009	
	Measured uranium concentration (µg/ml):	6.87E-02	1.53E-02	
	Uncertainty in uranium concentration (µg/ml):	6.87E-03	1.28E-04	
	Weight uranium leached (g):	8.45E-06	2.00E-06	1.05E-05
	Uncertainty in weight uranium leached (g):	8.46E-07	1.94E-08	8.46E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.07	< 5.40	<10.46
	Weight of impurity in blank (µg):	< 6.06	< 5.15	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.07	5.40	10.46
Cr	Measured concentration of impurity in sample (µg/ml):	3.94E-03	9.97E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.48	1.31	1.79
	Weight of impurity in blank (µg):	< 0.29	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.19	1.06	1.25
	Maximum corrected weight of impurity in sample (µg):	0.48	1.31	1.79
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.23	< 0.25	< 0.49
	Weight of impurity in blank (µg):	< 0.28	< 0.24	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.23	0.25	0.49
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.20	< 0.21	< 0.41
	Weight of impurity in blank (µg):	< 0.24	< 0.20	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.20	0.21	0.41
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 0.98	< 1.05	< 2.03
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.98	1.05	2.03
Ca	Measured concentration of impurity in sample (µg/ml):	4.73E-01	1.02E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	58.18	13.36	71.54
	Weight of impurity in blank (µg):	26.31	125.00	
	Minimum corrected weight of impurity in sample (µg):	31.87	0.00	31.87
	Maximum corrected weight of impurity in sample (µg):	31.87	0.00	31.87
Al	Measured concentration of impurity in sample (µg/ml):	3.51E-01	2.03E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	43.17	26.59	69.77
	Weight of impurity in blank (µg):	1.69	2.19	
	Minimum corrected weight of impurity in sample (µg):	41.48	24.41	65.89
	Maximum corrected weight of impurity in sample (µg):	41.48	24.41	65.89
Ti	Measured concentration of impurity in sample (µg/ml):	8.95E-03	2.49E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	1.10	3.26	4.36
	Weight of impurity in blank (µg):	< 1.18	< 1.00	
	Minimum corrected weight of impurity in sample (µg):	0.00	2.26	2.26
	Maximum corrected weight of impurity in sample (µg):	1.10	3.26	4.36
V	Measured concentration of impurity in sample (µg/ml):	1.33E-01	9.80E-02	**V**
	Uncorrected weight of impurity in sample (µg):	16.36	12.84	29.20
	Weight of impurity in blank (µg):	< 0.29	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	16.07	12.59	28.65
	Maximum corrected weight of impurity in sample (µg):	16.36	12.84	29.20

Comments

Data checked against RMAL 2419 official results of analyses by FCM on 12/09/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	Deconsolidation Leach Blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_04.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L09112005	L09112405	
	Number of compacts:	None		
	Total volume of leach solution (ml):	147.0	125.0	
	Radiochemical laboratory analysis number:	2419-005	2419-010	
	Measured uranium concentration (µg/ml):	<2.00E-04	<2.00E-04	
	Uncertainty in uranium concentration (µg/ml):			
	Weight uranium leached (g):	<2.94E-08	<2.50E-08	<5.44E-08
	Uncertainty in weight uranium leached (g):			
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:			
Fe	Measured concentration (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Total weight of leached impurity (µg):	< 6.06	< 5.15	<11.21
Cr	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	**Cr**
	Total weight of leached impurity (µg):	< 0.29	< 0.25	< 0.54
Mn	Measured concentration (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Total weight of leached impurity (µg):	< 0.28	< 0.24	< 0.52
Co	Measured concentration (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Total weight of leached impurity (µg):	< 0.24	< 0.20	< 0.44
Ni	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Total weight of leached impurity (µg):	< 1.18	< 1.00	< 2.18
Ca	Measured concentration (µg/ml):	1.79E-01	1.00E+00	**Ca**
	Total weight of leached impurity (µg):	26.31	125.00	151.31
Al	Measured concentration (µg/ml):	1.15E-02	1.75E-02	**Al**
	Total weight of leached impurity (µg):	1.69	2.19	3.88
Ti	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	**Ti**
	Total weight of leached impurity (µg):	< 1.18	< 1.00	< 2.18
V	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	**V**
	Total weight of leached impurity (µg):	< 0.29	< 0.25	< 0.54

Comments

Data checked against RMAL 2419 official results of analyses by FCM on 12/09/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	050, 044, 020, 164, 098
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_04.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09121001	B09121401	
	Number of compacts:	5		
	Total volume of leach solution (ml):	52.0	51.5	
	Radiochemical laboratory analysis number:	2452-001	2452-006	
	Measured uranium concentration (µg/ml):	2.66E-01	4.96E-03	
	Uncertainty in uranium concentration (µg/ml):	2.66E-02	4.96E-04	
	Weight uranium leached (g):	1.38E-05	2.55E-07	1.41E-05
	Uncertainty in weight uranium leached (g):	1.39E-06	2.57E-08	1.39E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	6.02E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	3.13	< 2.12	< 5.25
	Weight of impurity in blank (µg):	< 2.12	< 1.96	
	Minimum corrected weight of impurity in sample (µg):	1.01	0.00	1.01
	Maximum corrected weight of impurity in sample (µg):	3.13	2.12	5.25
Cr	Measured concentration of impurity in sample (µg/ml):	2.08E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.08	< 0.10	< 1.18
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.98	0.00	0.98
	Maximum corrected weight of impurity in sample (µg):	1.08	0.10	1.18
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.10	< 0.20
	Weight of impurity in blank (µg):	< 0.10	< 0.09	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.10	0.20
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.08	< 0.17
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.08	0.17
Ni	Measured concentration of impurity in sample (µg/ml):	5.20E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	2.70	< 0.41	< 3.12
	Weight of impurity in blank (µg):	< 0.41	< 0.38	
	Minimum corrected weight of impurity in sample (µg):	2.29	0.00	2.29
	Maximum corrected weight of impurity in sample (µg):	2.70	0.41	3.12
Ca	Measured concentration of impurity in sample (µg/ml):	1.92E+00	3.68E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	99.84	18.95	118.79
	Weight of impurity in blank (µg):	< 5.15	< 4.75	
	Minimum corrected weight of impurity in sample (µg):	94.69	14.20	108.89
	Maximum corrected weight of impurity in sample (µg):	99.84	18.95	118.79
Al	Measured concentration of impurity in sample (µg/ml):	1.54E+00	3.80E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	80.08	1.96	82.04
	Weight of impurity in blank (µg):	1.30	0.98	
	Minimum corrected weight of impurity in sample (µg):	78.78	0.98	79.76
	Maximum corrected weight of impurity in sample (µg):	78.78	0.98	79.76
Ti	Measured concentration of impurity in sample (µg/ml):	1.45E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	7.54	< 0.41	< 7.95
	Weight of impurity in blank (µg):	< 0.41	< 0.38	
	Minimum corrected weight of impurity in sample (µg):	7.13	0.00	7.13
	Maximum corrected weight of impurity in sample (µg):	7.54	0.41	7.95
V	Measured concentration of impurity in sample (µg/ml):	1.01E+00	7.61E-03	**V**
	Uncorrected weight of impurity in sample (µg):	52.52	0.39	52.91
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	52.42	0.30	52.71
	Maximum corrected weight of impurity in sample (µg):	52.52	0.39	52.91

Comments

Burn-leach solution is cloudy.
Data checked against RMAL 2452 official results of analyses by FCM on 12/21/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	027, 157, 054, 109, 070
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_04.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09121002	B09121402	
	Number of compacts:	5		
	Total volume of leach solution (ml):	44.5	49.5	
	Radiochemical laboratory analysis number:	2452-002	2452-007	
	Measured uranium concentration (µg/ml):	3.18E-01	3.02E-03	
	Uncertainty in uranium concentration (µg/ml):	3.18E-02	3.02E-04	
	Weight uranium leached (g):	1.42E-05	1.49E-07	1.43E-05
	Uncertainty in weight uranium leached (g):	1.43E-06	1.51E-08	1.43E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	6.27E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	2.79	< 2.04	< 4.83
	Weight of impurity in blank (µg):	< 2.12	< 1.96	
	Minimum corrected weight of impurity in sample (µg):	0.67	0.00	0.67
	Maximum corrected weight of impurity in sample (µg):	2.79	2.04	4.83
Cr	Measured concentration of impurity in sample (µg/ml):	1.97E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.88	< 0.10	< 0.98
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.77	0.00	0.77
	Maximum corrected weight of impurity in sample (µg):	0.88	0.10	0.98
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.09	< 0.18
	Weight of impurity in blank (µg):	< 0.10	< 0.09	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.09	0.18
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.07	< 0.08	< 0.15
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.07	0.08	0.15
Ni	Measured concentration of impurity in sample (µg/ml):	4.33E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	1.93	< 0.40	< 2.32
	Weight of impurity in blank (µg):	< 0.41	< 0.38	
	Minimum corrected weight of impurity in sample (µg):	1.51	0.00	1.51
	Maximum corrected weight of impurity in sample (µg):	1.93	0.40	2.32
Ca	Measured concentration of impurity in sample (µg/ml):	1.94E+00	< 1.00E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	86.33	< 4.95	<91.28
	Weight of impurity in blank (µg):	< 5.15	< 4.75	
	Minimum corrected weight of impurity in sample (µg):	81.18	0.00	81.18
	Maximum corrected weight of impurity in sample (µg):	86.33	4.95	91.28
Al	Measured concentration of impurity in sample (µg/ml):	1.53E+00	2.70E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	68.09	1.34	69.42
	Weight of impurity in blank (µg):	1.30	0.98	
	Minimum corrected weight of impurity in sample (µg):	66.78	0.36	67.14
	Maximum corrected weight of impurity in sample (µg):	66.78	0.36	67.14
Ti	Measured concentration of impurity in sample (µg/ml):	1.49E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	6.63	< 0.40	< 7.03
	Weight of impurity in blank (µg):	< 0.41	< 0.38	
	Minimum corrected weight of impurity in sample (µg):	6.22	0.00	6.22
	Maximum corrected weight of impurity in sample (µg):	6.63	0.40	7.03
V	Measured concentration of impurity in sample (µg/ml):	1.04E+00	4.61E-03	**V**
	Uncorrected weight of impurity in sample (µg):	46.28	0.23	46.51
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	46.18	0.13	46.31
	Maximum corrected weight of impurity in sample (µg):	46.28	0.23	46.51

Comments

This sample bumped particles into the condenser and bump trap. Burn-leach solution is cloudy.
Data checked against RMAL 2452 official results of analyses by FCM on 12/21/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	025, 106, 133, 110, 029
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_04.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09121003	B09121403	
	Number of compacts:	5		
	Total volume of leach solution (ml):	52.2	48.8	
	Radiochemical laboratory analysis number:	2452-003	2452-008	
	Measured uranium concentration (µg/ml):	2.76E-01	1.95E-03	
	Uncertainty in uranium concentration (µg/ml):	2.76E-02	1.95E-04	
	Weight uranium leached (g):	1.44E-05	9.52E-08	1.45E-05
	Uncertainty in weight uranium leached (g):	1.45E-06	9.60E-09	1.45E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	6.21E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	3.24	< 2.01	< 5.25
	Weight of impurity in blank (µg):	< 2.12	< 1.96	
	Minimum corrected weight of impurity in sample (µg):	1.12	0.00	1.12
	Maximum corrected weight of impurity in sample (µg):	3.24	2.01	5.25
Cr	Measured concentration of impurity in sample (µg/ml):	2.17E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.13	< 0.10	< 1.23
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	1.03	0.00	1.03
	Maximum corrected weight of impurity in sample (µg):	1.13	0.10	1.23
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.09	< 0.19
	Weight of impurity in blank (µg):	< 0.10	< 0.09	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.09	0.19
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.08	< 0.16
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.08	0.16
Ni	Measured concentration of impurity in sample (µg/ml):	3.09E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	1.61	< 0.39	< 2.00
	Weight of impurity in blank (µg):	< 0.41	< 0.38	
	Minimum corrected weight of impurity in sample (µg):	1.20	0.00	1.20
	Maximum corrected weight of impurity in sample (µg):	1.61	0.39	2.00
Ca	Measured concentration of impurity in sample (µg/ml):	1.96E+00	1.05E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	102.31	5.12	107.44
	Weight of impurity in blank (µg):	< 5.15	< 4.75	
	Minimum corrected weight of impurity in sample (µg):	97.16	0.37	97.54
	Maximum corrected weight of impurity in sample (µg):	102.31	5.12	107.44
Al	Measured concentration of impurity in sample (µg/ml):	1.49E+00	2.12E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	77.78	1.03	78.81
	Weight of impurity in blank (µg):	1.30	0.98	
	Minimum corrected weight of impurity in sample (µg):	76.48	0.06	76.53
	Maximum corrected weight of impurity in sample (µg):	76.48	0.06	76.53
Ti	Measured concentration of impurity in sample (µg/ml):	1.23E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	6.42	< 0.39	< 6.81
	Weight of impurity in blank (µg):	< 0.41	< 0.38	
	Minimum corrected weight of impurity in sample (µg):	6.01	0.00	6.01
	Maximum corrected weight of impurity in sample (µg):	6.42	0.39	6.81
V	Measured concentration of impurity in sample (µg/ml):	1.05E+00	5.12E-03	**V**
	Uncorrected weight of impurity in sample (µg):	54.81	0.25	55.06
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	54.71	0.15	54.86
	Maximum corrected weight of impurity in sample (µg):	54.81	0.25	55.06

Comments

Burn-leach solution is cloudy.
Data checked against RMAL 2452 official results of analyses by FCM on 12/21/2009

Fred C. Montgomery — Operator

1-27-2010 — Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	113, 162, 055, 137, 123
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_04.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09121004	B09121404	
	Number of compacts:	5		
	Total volume of leach solution (ml):	51.0	52.0	
	Radiochemical laboratory analysis number:	2452-004	2452-009	
	Measured uranium concentration (µg/ml):	2.69E-01	2.42E-03	
	Uncertainty in uranium concentration (µg/ml):	2.69E-02	2.42E-04	
	Weight uranium leached (g):	1.37E-05	1.26E-07	1.38E-05
	Uncertainty in weight uranium leached (g):	1.38E-06	1.27E-08	1.38E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	6.02E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	3.07	< 2.14	< 5.21
	Weight of impurity in blank (µg):	< 2.12	< 1.96	
	Minimum corrected weight of impurity in sample (µg):	0.95	0.00	0.95
	Maximum corrected weight of impurity in sample (µg):	3.07	2.14	5.21
Cr	Measured concentration of impurity in sample (µg/ml):	1.93E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.98	< 0.10	< 1.09
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.88	0.00	0.88
	Maximum corrected weight of impurity in sample (µg):	0.98	0.10	1.09
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.10	< 0.20
	Weight of impurity in blank (µg):	< 0.10	< 0.09	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.10	0.20
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.08	< 0.17
	Weight of impurity in blank (µg):	< 0.08	< 0.08	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.08	0.17
Ni	Measured concentration of impurity in sample (µg/ml):	5.20E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	2.65	< 0.42	< 3.07
	Weight of impurity in blank (µg):	< 0.41	< 0.38	
	Minimum corrected weight of impurity in sample (µg):	2.24	0.00	2.24
	Maximum corrected weight of impurity in sample (µg):	2.65	0.42	3.07
Ca	Measured concentration of impurity in sample (µg/ml):	1.98E+00	1.84E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	100.98	9.57	110.55
	Weight of impurity in blank (µg):	< 5.15	< 4.75	
	Minimum corrected weight of impurity in sample (µg):	95.83	4.82	100.65
	Maximum corrected weight of impurity in sample (µg):	100.98	9.57	110.55
Al	Measured concentration of impurity in sample (µg/ml):	1.56E+00	2.45E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	79.56	1.27	80.83
	Weight of impurity in blank (µg):	1.30	0.98	
	Minimum corrected weight of impurity in sample (µg):	78.26	0.30	78.55
	Maximum corrected weight of impurity in sample (µg):	78.26	0.30	78.55
Ti	Measured concentration of impurity in sample (µg/ml):	1.62E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	8.26	< 0.42	< 8.68
	Weight of impurity in blank (µg):	< 0.41	< 0.38	
	Minimum corrected weight of impurity in sample (µg):	7.85	0.00	7.85
	Maximum corrected weight of impurity in sample (µg):	8.26	0.42	8.68
V	Measured concentration of impurity in sample (µg/ml):	1.03E+00	3.26E-03	**V**
	Uncorrected weight of impurity in sample (µg):	52.53	0.17	52.70
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	52.43	0.07	52.50
	Maximum corrected weight of impurity in sample (µg):	52.53	0.17	52.70

Comments

Burn-leach solution is cloudy.
Data checked against RMAL 2452 official results of analyses by FCM on 12/21/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	Burn-Leach Blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z-DRF26R1_04.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B09121005	B09121405	
	Number of compacts:	None		
	Total volume of leach solution (ml):	51.5	47.5	
	Radiochemical laboratory analysis number:	2452-005	2452-010	
	Measured uranium concentration (µg/ml):	<2.00E-04	<2.00E-04	
	Uncertainty in uranium concentration (µg/ml):			
	Weight uranium leached (g):	<1.03E-08	<9.50E-09	<1.98E-08
	Uncertainty in weight uranium leached (g):			
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:			
Fe	Measured concentration (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Total weight of leached impurity (µg):	< 2.12	< 1.96	< 4.08
Cr	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	**Cr**
	Total weight of leached impurity (µg):	< 0.10	< 0.10	< 0.20
Mn	Measured concentration (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Total weight of leached impurity (µg):	< 0.10	< 0.09	< 0.19
Co	Measured concentration (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Total weight of leached impurity (µg):	< 0.08	< 0.08	< 0.16
Ni	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Total weight of leached impurity (µg):	< 0.41	< 0.38	< 0.79
Ca	Measured concentration (µg/ml):	< 1.00E-01	< 1.00E-01	**Ca**
	Total weight of leached impurity (µg):	< 5.15	< 4.75	< 9.90
Al	Measured concentration (µg/ml):	2.53E-02	2.06E-02	**Al**
	Total weight of leached impurity (µg):	1.30	0.98	2.28
Ti	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	**Ti**
	Total weight of leached impurity (µg):	< 0.41	< 0.38	< 0.79
V	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	**V**
	Total weight of leached impurity (µg):	< 0.10	< 0.10	< 0.20

Comments

Burn-leach solution is clear.
Data checked against RMAL 2452 official results of analyses by FCM on 12/21/2009

Fred C. Montgomery
Operator

1-27-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	108, 006, 096, 073, 094
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_05.xls

Mean average weight uranium per particle (g):	3.964E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L10010602	L10010802	
	Number of compacts:	5		
	Total volume of leach solution (ml):	118.0	120.0	
	Radiochemical laboratory analysis number:	2522-002	2522-007	
	Measured uranium concentration (µg/ml):	8.10E-02	1.26E-02	
	Uncertainty in uranium concentration (µg/ml):	8.10E-03	1.26E-03	
	Weight uranium leached (g):	9.56E-06	1.51E-06	1.11E-05
	Uncertainty in weight uranium leached (g):	9.57E-07	1.51E-07	9.69E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 4.86	< 4.94	< 9.81
	Weight of impurity in blank (µg):	< 6.06	< 5.31	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	4.86	4.94	9.81
Cr	Measured concentration of impurity in sample (µg/ml):	1.54E-02	7.95E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.82	0.95	2.77
	Weight of impurity in blank (µg):	< 0.29	< 0.26	
	Minimum corrected weight of impurity in sample (µg):	1.52	0.70	2.22
	Maximum corrected weight of impurity in sample (µg):	1.82	0.95	2.77
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.23	< 0.23	< 0.45
	Weight of impurity in blank (µg):	< 0.28	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.23	0.23	0.45
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.19	< 0.19	< 0.39
	Weight of impurity in blank (µg):	< 0.24	< 0.21	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.19	0.19	0.39
Ni	Measured concentration of impurity in sample (µg/ml):	1.36E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	1.60	< 0.96	< 2.56
	Weight of impurity in blank (µg):	< 1.18	< 1.03	
	Minimum corrected weight of impurity in sample (µg):	0.43	0.00	0.43
	Maximum corrected weight of impurity in sample (µg):	1.60	0.96	2.56
Ca	Measured concentration of impurity in sample (µg/ml):	5.54E-01	< 1.00E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	65.37	<12.00	<77.37
	Weight of impurity in blank (µg):	<14.70	19.87	
	Minimum corrected weight of impurity in sample (µg):	50.67	0.00	50.67
	Maximum corrected weight of impurity in sample (µg):	65.37	0.00	65.37
Al	Measured concentration of impurity in sample (µg/ml):	7.60E-01	1.28E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	89.68	15.36	105.04
	Weight of impurity in blank (µg):	7.23	1.15	
	Minimum corrected weight of impurity in sample (µg):	82.45	14.21	96.66
	Maximum corrected weight of impurity in sample (µg):	82.45	14.21	96.66
Ti	Measured concentration of impurity in sample (µg/ml):	3.83E-02	3.09E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	4.52	3.71	8.23
	Weight of impurity in blank (µg):	< 1.18	< 1.03	
	Minimum corrected weight of impurity in sample (µg):	3.34	2.68	6.02
	Maximum corrected weight of impurity in sample (µg):	4.52	3.71	8.23
V	Measured concentration of impurity in sample (µg/ml):	2.38E-01	4.73E-02	**V**
	Uncorrected weight of impurity in sample (µg):	28.08	5.68	33.76
	Weight of impurity in blank (µg):	< 0.29	< 0.26	
	Minimum corrected weight of impurity in sample (µg):	27.79	5.42	33.21
	Maximum corrected weight of impurity in sample (µg):	28.08	5.68	33.76

Comments

Data checked against RMAL 2522 official results of analyses by FCM on 2/01/2010.

Fred C. Montgomery
Operator

2-11-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	166, 111, 099, 042, 120
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_05.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L10010603	L10010803	
	Number of compacts:	5		
	Total volume of leach solution (ml):	124.0	125.0	
	Radiochemical laboratory analysis number:	2522-003	2522-008	
	Measured uranium concentration (µg/ml):	7.67E-02	1.29E-02	
	Uncertainty in uranium concentration (µg/ml):	7.67E-03	1.29E-03	
	Weight uranium leached (g):	9.51E-06	1.61E-06	1.11E-05
	Uncertainty in weight uranium leached (g):	9.52E-07	1.61E-07	9.66E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.11	< 5.15	<10.26
	Weight of impurity in blank (µg):	< 6.06	< 5.31	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.11	5.15	10.26
Cr	Measured concentration of impurity in sample (µg/ml):	1.48E-02	7.14E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.84	0.89	2.73
	Weight of impurity in blank (µg):	< 0.29	< 0.26	
	Minimum corrected weight of impurity in sample (µg):	1.54	0.63	2.18
	Maximum corrected weight of impurity in sample (µg):	1.84	0.89	2.73
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.24	< 0.24	< 0.48
	Weight of impurity in blank (µg):	< 0.28	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.24	0.24	0.48
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.20	< 0.20	< 0.40
	Weight of impurity in blank (µg):	< 0.24	< 0.21	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.20	0.20	0.40
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 0.99	< 1.00	< 1.99
	Weight of impurity in blank (µg):	< 1.18	< 1.03	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.99	1.00	1.99
Ca	Measured concentration of impurity in sample (µg/ml):	3.26E-01	1.92E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	40.42	24.00	64.42
	Weight of impurity in blank (µg):	<14.70	19.87	
	Minimum corrected weight of impurity in sample (µg):	25.72	4.13	29.86
	Maximum corrected weight of impurity in sample (µg):	40.42	4.13	44.56
Al	Measured concentration of impurity in sample (µg/ml):	4.82E-01	1.23E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	59.77	15.38	75.14
	Weight of impurity in blank (µg):	7.23	1.15	
	Minimum corrected weight of impurity in sample (µg):	52.54	14.22	66.76
	Maximum corrected weight of impurity in sample (µg):	52.54	14.22	66.76
Ti	Measured concentration of impurity in sample (µg/ml):	3.77E-02	2.74E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	4.67	3.43	8.10
	Weight of impurity in blank (µg):	< 1.18	< 1.03	
	Minimum corrected weight of impurity in sample (µg):	3.50	2.39	5.89
	Maximum corrected weight of impurity in sample (µg):	4.67	3.43	8.10
V	Measured concentration of impurity in sample (µg/ml):	2.30E-01	4.82E-02	**V**
	Uncorrected weight of impurity in sample (µg):	28.52	6.03	34.55
	Weight of impurity in blank (µg):	< 0.29	< 0.26	
	Minimum corrected weight of impurity in sample (µg):	28.23	5.77	33.99
	Maximum corrected weight of impurity in sample (µg):	28.52	6.03	34.55

Comments

Data checked against RMAL 2522 official results of analyses by FCM on 2/01/2010.

Fred C. Montgomery
Operator

2-11-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	101, 078, 136, 087, 122
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_05.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L10010604	L10010804	
	Number of compacts:	5		
	Total volume of leach solution (ml):	121.0	122.0	
	Radiochemical laboratory analysis number:	2522-004	2522-009	
	Measured uranium concentration (µg/ml):	7.57E-02	1.17E-02	
	Uncertainty in uranium concentration (µg/ml):	7.57E-03	1.17E-03	
	Weight uranium leached (g):	9.16E-06	1.43E-06	1.06E-05
	Uncertainty in weight uranium leached (g):	9.17E-07	1.43E-07	9.28E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 4.99	< 5.03	<10.01
	Weight of impurity in blank (µg):	< 6.06	< 5.31	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	4.99	5.03	10.01
Cr	Measured concentration of impurity in sample (µg/ml):	1.37E-02	7.84E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.66	0.96	2.61
	Weight of impurity in blank (µg):	< 0.29	< 0.26	
	Minimum corrected weight of impurity in sample (µg):	1.36	0.70	2.06
	Maximum corrected weight of impurity in sample (µg):	1.66	0.96	2.61
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.23	< 0.23	< 0.46
	Weight of impurity in blank (µg):	< 0.28	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.23	0.23	0.46
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.20	< 0.20	< 0.39
	Weight of impurity in blank (µg):	< 0.24	< 0.21	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.20	0.20	0.39
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 0.97	< 0.98	< 1.94
	Weight of impurity in blank (µg):	< 1.18	< 1.03	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.97	0.98	1.94
Ca	Measured concentration of impurity in sample (µg/ml):	3.81E-01	5.54E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	46.10	67.59	113.69
	Weight of impurity in blank (µg):	<14.70	19.87	
	Minimum corrected weight of impurity in sample (µg):	31.40	47.72	79.12
	Maximum corrected weight of impurity in sample (µg):	46.10	47.72	93.82
Al	Measured concentration of impurity in sample (µg/ml):	4.64E-01	1.05E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	56.14	12.81	68.95
	Weight of impurity in blank (µg):	7.23	1.15	
	Minimum corrected weight of impurity in sample (µg):	48.91	11.66	60.57
	Maximum corrected weight of impurity in sample (µg):	48.91	11.66	60.57
Ti	Measured concentration of impurity in sample (µg/ml):	3.35E-02	3.32E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	4.05	4.05	8.10
	Weight of impurity in blank (µg):	< 1.18	< 1.03	
	Minimum corrected weight of impurity in sample (µg):	2.88	3.02	5.90
	Maximum corrected weight of impurity in sample (µg):	4.05	4.05	8.10
V	Measured concentration of impurity in sample (µg/ml):	2.35E-01	5.12E-02	**V**
	Uncorrected weight of impurity in sample (µg):	28.44	6.25	34.68
	Weight of impurity in blank (µg):	< 0.29	< 0.26	
	Minimum corrected weight of impurity in sample (µg):	28.14	5.99	34.13
	Maximum corrected weight of impurity in sample (µg):	28.44	6.25	34.68

Comments

Data checked against RMAL 2522 official results of analyses by FCM on 2/01/2010.

Fred C. Montgomery
Operator

2-11-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	052, 146, 161, 115, 095
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_05.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L10010605	L10010805	
	Number of compacts:	5		
	Total volume of leach solution (ml):	122.0	125.0	
	Radiochemical laboratory analysis number:	2522-005	2522-010	
	Measured uranium concentration (µg/ml):	7.67E-02	1.24E-02	
	Uncertainty in uranium concentration (µg/ml):	7.67E-03	1.24E-03	
	Weight uranium leached (g):	9.36E-06	1.55E-06	1.09E-05
	Uncertainty in weight uranium leached (g):	9.37E-07	1.55E-07	9.50E-07
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	< 4.12E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	< 5.03	< 5.15	<10.18
	Weight of impurity in blank (µg):	< 6.06	< 5.31	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	5.03	5.15	10.18
Cr	Measured concentration of impurity in sample (µg/ml):	1.53E-02	7.02E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.87	0.88	2.74
	Weight of impurity in blank (µg):	< 0.29	< 0.26	
	Minimum corrected weight of impurity in sample (µg):	1.57	0.62	2.19
	Maximum corrected weight of impurity in sample (µg):	1.87	0.88	2.74
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.23	< 0.24	< 0.47
	Weight of impurity in blank (µg):	< 0.28	< 0.25	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.23	0.24	0.47
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.20	< 0.20	< 0.40
	Weight of impurity in blank (µg):	< 0.24	< 0.21	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.20	0.20	0.40
Ni	Measured concentration of impurity in sample (µg/ml):	< 8.00E-03	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	< 0.98	< 1.00	< 1.98
	Weight of impurity in blank (µg):	< 1.18	< 1.03	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.98	1.00	1.98
Ca	Measured concentration of impurity in sample (µg/ml):	1.08E+00	1.39E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	131.76	17.38	149.14
	Weight of impurity in blank (µg):	<14.70	19.87	
	Minimum corrected weight of impurity in sample (µg):	117.06	0.00	117.06
	Maximum corrected weight of impurity in sample (µg):	131.76	0.00	131.76
Al	Measured concentration of impurity in sample (µg/ml):	5.22E-01	1.20E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	63.68	15.00	78.68
	Weight of impurity in blank (µg):	7.23	1.15	
	Minimum corrected weight of impurity in sample (µg):	56.45	13.85	70.30
	Maximum corrected weight of impurity in sample (µg):	56.45	13.85	70.30
Ti	Measured concentration of impurity in sample (µg/ml):	4.16E-02	2.65E-02	**Ti**
	Uncorrected weight of impurity in sample (µg):	5.08	3.31	8.39
	Weight of impurity in blank (µg):	< 1.18	< 1.03	
	Minimum corrected weight of impurity in sample (µg):	3.90	2.28	6.18
	Maximum corrected weight of impurity in sample (µg):	5.08	3.31	8.39
V	Measured concentration of impurity in sample (µg/ml):	2.20E-01	4.34E-02	**V**
	Uncorrected weight of impurity in sample (µg):	26.84	5.43	32.27
	Weight of impurity in blank (µg):	< 0.29	< 0.26	
	Minimum corrected weight of impurity in sample (µg):	26.55	5.17	31.71
	Maximum corrected weight of impurity in sample (µg):	26.84	5.43	32.27

Comments

Data checked against RMAL 2522 official results of analyses by FCM on 2/01/2010.

Fred C. Montgomery
Operator

2-11-2010
Date

Data Report Form DRF-26A: Measurement of U Contamination or Impurities by Deconsolidation Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	Deconsolidation Leach Blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_05.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Deconsolidation-leach solution ID:	L10010601	L10010801	
	Number of compacts:	None		
	Total volume of leach solution (ml):	147.0	129.0	
	Radiochemical laboratory analysis number:	2522-001	2522-006	
	Measured uranium concentration (µg/ml):	<2.00E-04	<2.00E-04	
	Uncertainty in uranium concentration (µg/ml):			
	Weight uranium leached (g):	<2.94E-08	<2.58E-08	<5.52E-08
	Uncertainty in weight uranium leached (g):			
	Effective number of exposed kernels:	0.0	0.0	0.0
	Uncertainty in effective number of exposed kernels:			
Fe	Measured concentration (µg/ml):	< 4.12E-02	< 4.12E-02	Fe
	Total weight of leached impurity (µg):	< 6.06	< 5.31	<11.37
Cr	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	Cr
	Total weight of leached impurity (µg):	< 0.29	< 0.26	< 0.55
Mn	Measured concentration (µg/ml):	< 1.91E-03	< 1.91E-03	Mn
	Total weight of leached impurity (µg):	< 0.28	< 0.25	< 0.53
Co	Measured concentration (µg/ml):	< 1.62E-03	< 1.62E-03	Co
	Total weight of leached impurity (µg):	< 0.24	< 0.21	< 0.45
Ni	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	Ni
	Total weight of leached impurity (µg):	< 1.18	< 1.03	< 2.21
Ca	Measured concentration (µg/ml):	< 1.00E-01	1.54E-01	Ca
	Total weight of leached impurity (µg):	<14.70	19.87	<34.57
Al	Measured concentration (µg/ml):	4.92E-02	8.93E-03	Al
	Total weight of leached impurity (µg):	7.23	1.15	8.38
Ti	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	Ti
	Total weight of leached impurity (µg):	< 1.18	< 1.03	< 2.21
V	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	V
	Total weight of leached impurity (µg):	< 0.29	< 0.26	< 0.55

Comments

Data checked against RMAL 2522 official results of analyses by FCM on 2/01/2010.

Fred C. Montgomery
Operator

2-11-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	108, 006, 096, 073, 094
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_05.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B10011902	B10012102	
	Number of compacts:	5		
	Total volume of leach solution (ml):	49.5	53.0	
	Radiochemical laboratory analysis number:	2550-002	2550-007	
	Measured uranium concentration (µg/ml):	2.45E-01	2.66E-03	
	Uncertainty in uranium concentration (µg/ml):	2.45E-02	2.66E-04	
	Weight uranium leached (g):	1.21E-05	1.41E-07	1.23E-05
	Uncertainty in weight uranium leached (g):	1.22E-06	1.42E-08	1.22E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	9.91E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	4.91	< 2.18	< 7.09
	Weight of impurity in blank (µg):	< 2.13	< 2.25	
	Minimum corrected weight of impurity in sample (µg):	2.77	0.00	2.77
	Maximum corrected weight of impurity in sample (µg):	4.91	2.18	7.09
Cr	Measured concentration of impurity in sample (µg/ml):	2.39E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.18	< 0.11	< 1.29
	Weight of impurity in blank (µg):	< 0.10	< 0.11	
	Minimum corrected weight of impurity in sample (µg):	1.08	0.00	1.08
	Maximum corrected weight of impurity in sample (µg):	1.18	0.11	1.29
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.09	< 0.10	< 0.20
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.09	0.10	0.20
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.09	< 0.17
	Weight of impurity in blank (µg):	< 0.08	< 0.09	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.09	0.17
Ni	Measured concentration of impurity in sample (µg/ml):	7.44E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	3.68	< 0.42	< 4.11
	Weight of impurity in blank (µg):	< 0.41	< 0.44	
	Minimum corrected weight of impurity in sample (µg):	3.27	0.00	3.27
	Maximum corrected weight of impurity in sample (µg):	3.68	0.42	4.11
Ca	Measured concentration of impurity in sample (µg/ml):	2.06E+00	7.83E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	101.97	41.50	143.47
	Weight of impurity in blank (µg):	9.69	< 5.45	
	Minimum corrected weight of impurity in sample (µg):	92.28	36.05	128.33
	Maximum corrected weight of impurity in sample (µg):	92.28	41.50	133.78
Al	Measured concentration of impurity in sample (µg/ml):	2.07E+00	4.59E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	102.47	2.43	104.90
	Weight of impurity in blank (µg):	1.71	1.02	
	Minimum corrected weight of impurity in sample (µg):	100.75	1.41	102.16
	Maximum corrected weight of impurity in sample (µg):	100.75	1.41	102.16
Ti	Measured concentration of impurity in sample (µg/ml):	1.24E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	6.14	< 0.42	< 6.56
	Weight of impurity in blank (µg):	< 0.41	< 0.44	
	Minimum corrected weight of impurity in sample (µg):	5.72	0.00	5.72
	Maximum corrected weight of impurity in sample (µg):	6.14	0.42	6.56
V	Measured concentration of impurity in sample (µg/ml):	1.08E+00	3.10E-03	**V**
	Uncorrected weight of impurity in sample (µg):	53.46	0.16	53.62
	Weight of impurity in blank (µg):	< 0.10	< 0.11	
	Minimum corrected weight of impurity in sample (µg):	53.36	0.06	53.41
	Maximum corrected weight of impurity in sample (µg):	53.46	0.16	53.62

Comments

First leach for calcium was re-analyzed due to possible Ca contamination during initial analysis. Initial measurement per RMAL 2550-002 was 3.50 ug/ml. Re-analysis result entered into table above was obtained per RMAL 2579.
Data checked against RMAL 2550 official results of analyses by FCM on 1/29/2010 and RMAL 2579 official results of analyses by FCM on 2/11/2010.

Fred C. Montgomery — Operator

2-11-2010 — Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	166, 111, 099, 042, 120
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_05.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B10011903	B10012103	
	Number of compacts:	5		
	Total volume of leach solution (ml):	48.5	51.9	
	Radiochemical laboratory analysis number:	2550-003	2550-008	
	Measured uranium concentration (µg/ml):	2.44E-01	3.17E-03	
	Uncertainty in uranium concentration (µg/ml):	2.44E-02	3.17E-04	
	Weight uranium leached (g):	1.18E-05	1.65E-07	1.20E-05
	Uncertainty in weight uranium leached (g):	1.19E-06	1.66E-08	1.19E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	9.76E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	4.73	< 2.14	< 6.87
	Weight of impurity in blank (µg):	< 2.13	< 2.25	
	Minimum corrected weight of impurity in sample (µg):	2.60	0.00	2.60
	Maximum corrected weight of impurity in sample (µg):	4.73	2.14	6.87
Cr	Measured concentration of impurity in sample (µg/ml):	2.06E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.00	< 0.10	< 1.10
	Weight of impurity in blank (µg):	< 0.10	< 0.11	
	Minimum corrected weight of impurity in sample (µg):	0.90	0.00	0.90
	Maximum corrected weight of impurity in sample (µg):	1.00	0.10	1.10
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.09	< 0.10	< 0.19
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.09	0.10	0.19
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.08	< 0.16
	Weight of impurity in blank (µg):	< 0.08	< 0.09	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.08	0.16
Ni	Measured concentration of impurity in sample (µg/ml):	3.14E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	1.52	< 0.42	< 1.94
	Weight of impurity in blank (µg):	< 0.41	< 0.44	
	Minimum corrected weight of impurity in sample (µg):	1.11	0.00	1.11
	Maximum corrected weight of impurity in sample (µg):	1.52	0.42	1.94
Ca	Measured concentration of impurity in sample (µg/ml):	1.83E+00	1.03E+00	**Ca**
	Uncorrected weight of impurity in sample (µg):	88.76	53.46	142.21
	Weight of impurity in blank (µg):	9.69	< 5.45	
	Minimum corrected weight of impurity in sample (µg):	79.07	48.01	127.08
	Maximum corrected weight of impurity in sample (µg):	79.07	53.46	132.53
Al	Measured concentration of impurity in sample (µg/ml):	1.80E+00	4.06E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	87.30	2.11	89.41
	Weight of impurity in blank (µg):	1.71	1.02	
	Minimum corrected weight of impurity in sample (µg):	85.59	1.08	86.67
	Maximum corrected weight of impurity in sample (µg):	85.59	1.08	86.67
Ti	Measured concentration of impurity in sample (µg/ml):	1.20E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	5.82	< 0.42	< 6.24
	Weight of impurity in blank (µg):	< 0.41	< 0.44	
	Minimum corrected weight of impurity in sample (µg):	5.41	0.00	5.41
	Maximum corrected weight of impurity in sample (µg):	5.82	0.42	6.24
V	Measured concentration of impurity in sample (µg/ml):	1.04E+00	9.43E-03	**V**
	Uncorrected weight of impurity in sample (µg):	50.44	0.49	50.93
	Weight of impurity in blank (µg):	< 0.10	< 0.11	
	Minimum corrected weight of impurity in sample (µg):	50.34	0.38	50.72
	Maximum corrected weight of impurity in sample (µg):	50.44	0.49	50.93

Comments

First leach for calcium was re-analyzed due to possible Ca contamination during initial analysis. Initial measurement per RMAL 2550-003 was 6.52 ug/ml. Re-analysis result entered into table above was obtained per RMAL 2579.
Data checked against RMAL 2550 official results of analyses by FCM on 1/29/2010 and RMAL 2579 official results of analyses by FCM on 2/11/2010.

Fred C. Montgomery
Operator

2-11-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	101, 078, 136, 087, 122
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_05.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B10011904	B10012104	
	Number of compacts:	5		
	Total volume of leach solution (ml):	48.5	50.7	
	Radiochemical laboratory analysis number:	2550-004	2550-009	
	Measured uranium concentration (µg/ml):	2.44E-01	2.65E-03	
	Uncertainty in uranium concentration (µg/ml):	2.44E-02	2.65E-04	
	Weight uranium leached (g):	1.18E-05	1.34E-07	1.20E-05
	Uncertainty in weight uranium leached (g):	1.19E-06	1.35E-08	1.19E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	5.69E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	2.76	< 2.09	< 4.85
	Weight of impurity in blank (µg):	< 2.13	< 2.25	
	Minimum corrected weight of impurity in sample (µg):	0.63	0.00	0.63
	Maximum corrected weight of impurity in sample (µg):	2.76	2.09	4.85
Cr	Measured concentration of impurity in sample (µg/ml):	2.04E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	0.99	< 0.10	< 1.09
	Weight of impurity in blank (µg):	< 0.10	< 0.11	
	Minimum corrected weight of impurity in sample (µg):	0.89	0.00	0.89
	Maximum corrected weight of impurity in sample (µg):	0.99	0.10	1.09
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.09	< 0.10	< 0.19
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.09	0.10	0.19
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.08	< 0.16
	Weight of impurity in blank (µg):	< 0.08	< 0.09	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.08	0.16
Ni	Measured concentration of impurity in sample (µg/ml):	2.94E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	1.43	< 0.41	< 1.83
	Weight of impurity in blank (µg):	< 0.41	< 0.44	
	Minimum corrected weight of impurity in sample (µg):	1.01	0.00	1.01
	Maximum corrected weight of impurity in sample (µg):	1.43	0.41	1.83
Ca	Measured concentration of impurity in sample (µg/ml):	1.91E+00	4.63E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	92.64	23.47	116.11
	Weight of impurity in blank (µg):	9.69	< 5.45	
	Minimum corrected weight of impurity in sample (µg):	82.95	18.02	100.97
	Maximum corrected weight of impurity in sample (µg):	82.95	23.47	106.42
Al	Measured concentration of impurity in sample (µg/ml):	1.88E+00	6.45E-02	**Al**
	Uncorrected weight of impurity in sample (µg):	91.18	3.27	94.45
	Weight of impurity in blank (µg):	1.71	1.02	
	Minimum corrected weight of impurity in sample (µg):	89.47	2.25	91.71
	Maximum corrected weight of impurity in sample (µg):	89.47	2.25	91.71
Ti	Measured concentration of impurity in sample (µg/ml):	1.45E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	7.03	< 0.41	< 7.44
	Weight of impurity in blank (µg):	< 0.41	< 0.44	
	Minimum corrected weight of impurity in sample (µg):	6.62	0.00	6.62
	Maximum corrected weight of impurity in sample (µg):	7.03	0.41	7.44
V	Measured concentration of impurity in sample (µg/ml):	1.11E+00	7.08E-03	**V**
	Uncorrected weight of impurity in sample (µg):	53.84	0.36	54.19
	Weight of impurity in blank (µg):	< 0.10	< 0.11	
	Minimum corrected weight of impurity in sample (µg):	53.73	0.25	53.98
	Maximum corrected weight of impurity in sample (µg):	53.84	0.36	54.19

Comments

First leach for calcium was re-analyzed due to possible Ca contamination during initial analysis. Initial measurement per RMAL 2550-004 was 2.22 ug/ml. Re-analysis result entered into table above was obtained per RMAL 2579.
Data checked against RMAL 2550 official results of analyses by FCM on 1/29/2010 and RMAL 2579 official results of analyses by FCM on 2/11/2010.

Fred C. Montgomery
Operator

2-11-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	052, 146, 161, 115, 095
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_05.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B10011905	B10012105	
	Number of compacts:	5		
	Total volume of leach solution (ml):	49.8	53.8	
	Radiochemical laboratory analysis number:	2550-005	2550-010	
	Measured uranium concentration (µg/ml):	2.47E-01	1.84E-03	
	Uncertainty in uranium concentration (µg/ml):	2.47E-02	1.84E-04	
	Weight uranium leached (g):	1.23E-05	9.90E-08	1.24E-05
	Uncertainty in weight uranium leached (g):	1.24E-06	9.97E-09	1.24E-06
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:	0.0	0.0	0.0
Fe	Measured concentration of impurity in sample (µg/ml):	5.87E-02	< 4.12E-02	**Fe**
	Uncorrected weight of impurity in sample (µg):	2.92	< 2.22	< 5.14
	Weight of impurity in blank (µg):	< 2.13	< 2.25	
	Minimum corrected weight of impurity in sample (µg):	0.79	0.00	0.79
	Maximum corrected weight of impurity in sample (µg):	2.92	2.22	5.14
Cr	Measured concentration of impurity in sample (µg/ml):	2.19E-02	< 2.00E-03	**Cr**
	Uncorrected weight of impurity in sample (µg):	1.09	< 0.11	< 1.20
	Weight of impurity in blank (µg):	< 0.10	< 0.11	
	Minimum corrected weight of impurity in sample (µg):	0.99	0.00	0.99
	Maximum corrected weight of impurity in sample (µg):	1.09	0.11	1.20
Mn	Measured concentration of impurity in sample (µg/ml):	< 1.91E-03	< 1.91E-03	**Mn**
	Uncorrected weight of impurity in sample (µg):	< 0.10	< 0.10	< 0.20
	Weight of impurity in blank (µg):	< 0.10	< 0.10	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.10	0.10	0.20
Co	Measured concentration of impurity in sample (µg/ml):	< 1.62E-03	< 1.62E-03	**Co**
	Uncorrected weight of impurity in sample (µg):	< 0.08	< 0.09	< 0.17
	Weight of impurity in blank (µg):	< 0.08	< 0.09	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00
	Maximum corrected weight of impurity in sample (µg):	0.08	0.09	0.17
Ni	Measured concentration of impurity in sample (µg/ml):	3.64E-02	< 8.00E-03	**Ni**
	Uncorrected weight of impurity in sample (µg):	1.81	< 0.43	< 2.24
	Weight of impurity in blank (µg):	< 0.41	< 0.44	
	Minimum corrected weight of impurity in sample (µg):	1.40	0.00	1.40
	Maximum corrected weight of impurity in sample (µg):	1.81	0.43	2.24
Ca	Measured concentration of impurity in sample (µg/ml):	1.99E+00	6.85E-01	**Ca**
	Uncorrected weight of impurity in sample (µg):	99.10	36.85	135.96
	Weight of impurity in blank (µg):	9.69	< 5.45	
	Minimum corrected weight of impurity in sample (µg):	89.42	31.40	120.82
	Maximum corrected weight of impurity in sample (µg):	89.42	36.85	126.27
Al	Measured concentration of impurity in sample (µg/ml):	1.85E+00	1.26E-01	**Al**
	Uncorrected weight of impurity in sample (µg):	92.13	6.78	98.91
	Weight of impurity in blank (µg):	1.71	1.02	
	Minimum corrected weight of impurity in sample (µg):	90.42	5.75	96.17
	Maximum corrected weight of impurity in sample (µg):	90.42	5.75	96.17
Ti	Measured concentration of impurity in sample (µg/ml):	1.09E-01	< 8.00E-03	**Ti**
	Uncorrected weight of impurity in sample (µg):	5.43	< 0.43	< 5.86
	Weight of impurity in blank (µg):	< 0.41	< 0.44	
	Minimum corrected weight of impurity in sample (µg):	5.01	0.00	5.01
	Maximum corrected weight of impurity in sample (µg):	5.43	0.43	5.86
V	Measured concentration of impurity in sample (µg/ml):	9.88E-01	5.81E-03	**V**
	Uncorrected weight of impurity in sample (µg):	49.20	0.31	49.51
	Weight of impurity in blank (µg):	< 0.10	< 0.11	
	Minimum corrected weight of impurity in sample (µg):	49.10	0.20	49.30
	Maximum corrected weight of impurity in sample (µg):	49.20	0.31	49.51

Comments

First leach for calcium was re-analyzed due to possible Ca contamination during initial analysis. Initial measurement per RMAL 2550-005 was 3.04 ug/ml. Re-analysis result entered into table above was obtained per RMAL 2579.
Data checked against RMAL 2550 official results of analyses by FCM on 1/29/2010 and RMAL 2579 official results of analyses by FCM on 2/11/2010.

Fred C. Montgomery
Operator

2-11-2010
Date

Data Report Form DRF-26B: Measurement of SiC Burn-Leach Defects or Impurities by Burn-Leach

Procedure:	AGR-CHAR-DAM-26 Rev. 1
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID numbers:	Burn-Leach Blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\LEU09-OP2-Z_DRF26R1_05.xls

Mean average weight uranium per particle (g):	3.96E-04
Uncertainty in mean average weight uranium per particle (g):	8.10E-07

		First Leach	Second Leach	Total
	Burn-leach solution ID:	B10011901	B10012101	
	Number of compacts:	None		
	Total volume of leach solution (ml):	51.8	54.5	
	Radiochemical laboratory analysis number:	2550-001	2550-006	
	Measured uranium concentration (µg/ml):	<2.00E-04	<2.00E-04	
	Uncertainty in uranium concentration (µg/ml):			
	Weight uranium leached (g):	<1.04E-08	<1.09E-08	<2.13E-08
	Uncertainty in weight uranium leached (g):			
	Number of leached kernels:	0.0	0.0	0.0
	Uncertainty in number of leached kernels:			
Fe	Measured concentration (µg/ml):	< 4.12E-02	< 4.12E-02	Fe
	Total weight of leached impurity (µg):	< 2.13	< 2.25	< 4.38
Cr	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	Cr
	Total weight of leached impurity (µg):	< 0.10	< 0.11	< 0.21
Mn	Measured concentration (µg/ml):	< 1.91E-03	< 1.91E-03	Mn
	Total weight of leached impurity (µg):	< 0.10	< 0.10	< 0.20
Co	Measured concentration (µg/ml):	< 1.62E-03	< 1.62E-03	Co
	Total weight of leached impurity (µg):	< 0.08	< 0.09	< 0.17
Ni	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	Ni
	Total weight of leached impurity (µg):	< 0.41	< 0.44	< 0.85
Ca	Measured concentration (µg/ml):	1.87E-01	< 1.00E-01	Ca
	Total weight of leached impurity (µg):	9.69	< 5.45	<15.14
Al	Measured concentration (µg/ml):	3.31E-02	1.88E-02	Al
	Total weight of leached impurity (µg):	1.71	1.02	2.74
Ti	Measured concentration (µg/ml):	< 8.00E-03	< 8.00E-03	Ti
	Total weight of leached impurity (µg):	< 0.41	< 0.44	< 0.85
V	Measured concentration (µg/ml):	< 2.00E-03	< 2.00E-03	V
	Total weight of leached impurity (µg):	< 0.10	< 0.11	< 0.21

Comments

First and second leach for calcium were re-analyzed due to possible Ca contamination during initial analysis. Initial measurement per RMAL2550-001 = 2.04 ug/ml and RMAL2550-006 = 2.10 ug/ml. Re-analysis result entered into table above was obtained per RMAL 2579.
Data checked against RMAL 2550 official results of analyses by FCM on 1/29/2010 and RMAL 2579 official results of analyses by FCM on 2/11/2010.

Fred C. Montgomery
Operator

2-11-2010
Date

Data Report Form DRF-27: Counting of Particles with a Defective OPyC Layer from Deconsolidated Compacts by Visual Inspection

Procedure:	AGR-CHAR-DAM-27 Rev. 0
Operator:	Fred Montgomery
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant, from G73J-14-93073A
Compact ID number:	091
DRF filename:	\\mc-agr\AGR\DefectiveOPyC\LEU09-OP2-Z_DRF27R0.xls

Number of particles with cracked OPyC:	0
Number of particles with partially missing OPyC:	0
Number of particles with completely missing OPyC:	0
Total number of particles with defective OPyC:	0

Comments on unusual visual characteristics of OPyC

Fred C. Montgomery
Operator

11-17-09
Date

Data Report Form DRF-28: Counting of Particles with Excessive Uranium Dispersion Inside SiC

Procedure:	AGR-CHAR-DAM-28 Rev. 2
Operator:	John Hunn/Ivan Dunbar/Paul Menchhofer/Chinthaka Silva
Compact lot ID:	LEU09-OP2-Z
Compact lot description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A
Compact ID numbers:	011 152 001 068 046 067 081 019 008 032 039 036 155 012 117 031 149 093 147 072
DRF filename:	\\mc-agr\AGR\DefectiveIPyC\LEU09-OP2-Z_DRF28R2.xls

Number of compacts from which particles were recovered:	20

Weight of sample of particles (g):	54.245
Number of particles in sample:	63525
Mean average weight/particle (g):	8.54E-04

Number of particles with excessive U dispersion:	0

Comments

John Hunn — Operator

1-11-10 — Date

For Information Only

The information in the remainder of this section is from additional characterization that was not required by the fuel product specification.

Anisotropy of pyrocarbon layers after compacting

To examine the change in pyrocarbon anisotropy during compact fabrication, particles were recovered after deconsolidation of the particles from the compact for defective OPyC analysis. After compacting, the anisotropy of the pyrocarbon layers was observed to increase. This increase occurs during the heat treatment of the compacts at 1800°C for 1 hour. The diattenuation of the IPyC increased from 0.0116±0.0004 to 0.0155±0.0016 (1.0349±0.0012 to 1.0465±0.0049 in terms of effective BAFo). The diattenuation of the OPyC increased from 0.0088±0.0004 to 0.0143±0.0006 (1.0263±0.0011 to 1.0429±0.0019 in terms of effective BAFo). The following data report forms contain the data for these measurements.

Data Report Form DRF-18A: Measurement of Pyrocarbon Anisotropy using the 2-MGEM - IPyC

Procedure:	AGR-CHAR-DAM-18 Rev. 1
Operator:	G. E. Jellison
Mount ID:	M0911300101
Sample ID:	LEU09-OP2-Z091
Sample Description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A, after compacting
Folder containing data:	\\mc-agr\AGR\2-MGEM\R09120901\

Particle #	Grid Position	Diattenuation			True BAFo = (1+N)/(1-N)		
		Average	St. Dev.	Ave. Error	Average	St. Dev.	Ave. Error
1	4,4	0.0144	0.0025	0.0005	1.0292	0.0051	0.0010
2	4,6	0.0116	0.0029	0.0006	1.0235	0.0059	0.0012
3	5,4	0.0167	0.0027	0.0006	1.0340	0.0056	0.0012
4	5,5	0.0169	0.0029	0.0006	1.0344	0.0060	0.0012
5	5,6	0.0144	0.0025	0.0006	1.0292	0.0051	0.0012
6	6,4	0.0161	0.0024	0.0006	1.0327	0.0050	0.0012
7	6,5	0.0167	0.0029	0.0006	1.0340	0.0060	0.0012
8	6,6	0.0161	0.0030	0.0006	1.0327	0.0062	0.0012
9	7,4	0.0161	0.0029	0.0006	1.0327	0.0060	0.0012
10	7,5	0.0159	0.0029	0.0007	1.0323	0.0060	0.0014
Average		0.0155	0.0028	0.0006	1.0315	0.0057	0.0012

Mean of average BAFo per particle:	1.0315
Standard deviation of average BAFo per particle:	0.0033

Comments

G. E. Jellison
Operator

12/16/09
Date

Data Report Form DRF-18A: Measurement of Pyrocarbon Anisotropy using the 2-MGEM - IPyC

Procedure:	AGR-CHAR-DAM-18 Rev. 1
Operator:	G. E. Jellison
Mount ID:	M0911300101
Sample ID:	LEU09-OP2-Z091
Sample Description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A, after compacting
Folder containing data:	\\mc-agr\AGR\2-MGEM\R09120901\

Particle #	Grid Position	Diattenuation			Equivalent BAFo = 1+3N		
		Average	St. Dev.	Ave. Error	Average	St. Dev.	Ave. Error
1	4,4	0.0144	0.0025	0.0005	1.0432	0.0075	0.0015
2	4,6	0.0116	0.0029	0.0006	1.0348	0.0087	0.0018
3	5,4	0.0167	0.0027	0.0006	1.0501	0.0081	0.0018
4	5,5	0.0169	0.0029	0.0006	1.0507	0.0087	0.0018
5	5,6	0.0144	0.0025	0.0006	1.0432	0.0075	0.0018
6	6,4	0.0161	0.0024	0.0006	1.0483	0.0072	0.0018
7	6,5	0.0167	0.0029	0.0006	1.0501	0.0087	0.0018
8	6,6	0.0161	0.0030	0.0006	1.0483	0.0090	0.0018
9	7,4	0.0161	0.0029	0.0006	1.0483	0.0087	0.0018
10	7,5	0.0159	0.0029	0.0007	1.0477	0.0087	0.0021
Average		0.0155	0.0028	0.0006	1.0465	0.0083	0.0018

Mean of average BAFo per particle:	1.0465
Standard deviation of average BAFo per particle:	0.0049

Comments

G. E. Jellison
Operator

12/16/09
Date

Data Report Form DRF-18B: Measurement of Pyrocarbon Anisotropy using the 2-MGEM - OPyC

Procedure:	AGR-CHAR-DAM-18 Rev. 1
Operator:	G. E. Jellison
Mount ID:	M0911300101
Sample ID:	LEU09-OP2-Z091
Sample Description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A, after compacting
Folder containing data:	\\mc-agr\AGR\2-MGEM\R09120901\

Particle #	Grid Position	Diattenuation			True BAFo = (1+N)/(1-N)		
		Average	St. Dev.	Ave. Error	Average	St. Dev.	Ave. Error
1	4,4	0.0138	0.0030	0.0007	1.0280	0.0062	0.0014
2	4,6	0.0130	0.0031	0.0008	1.0263	0.0064	0.0016
3	5,4	0.0146	0.0031	0.0008	1.0296	0.0064	0.0016
4	5,5	0.0146	0.0035	0.0007	1.0296	0.0072	0.0014
5	5,6	0.0137	0.0031	0.0007	1.0278	0.0064	0.0014
6	6,4	0.0149	0.0032	0.0008	1.0303	0.0066	0.0016
7	6,5	0.0145	0.0028	0.0008	1.0294	0.0058	0.0016
8	6,6	0.0141	0.0031	0.0008	1.0286	0.0064	0.0016
9	7,4	0.0150	0.0032	0.0008	1.0305	0.0066	0.0016
10	7,5	0.0147	0.0031	0.0008	1.0298	0.0064	0.0016
Average		0.0143	0.0031	0.0008	1.0290	0.0064	0.0016

Mean of average BAFo per particle:	1.0290
Standard deviation of average BAFo per particle:	0.0013

Comments

G. E. Jellison
Operator

12/16/09
Date

Data Report Form DRF-18B: Measurement of Pyrocarbon Anisotropy using the 2-MGEM - OPyC

Procedure:	AGR-CHAR-DAM-18 Rev. 1
Operator:	G. E. Jellison
Mount ID:	M0911300101
Sample ID:	LEU09-OP2-Z091
Sample Description:	AGR-2 UCO Variant Fuel, from G73J-14-93073A, after compacting
Folder containing data:	\\mc-agr\AGR\2-MGEM\R09120901\

Particle #	Grid Position	Diattenuation			Equivalent BAFo = 1+3N		
		Average	St. Dev.	Ave. Error	Average	St. Dev.	Ave. Error
1	4,4	0.0138	0.0030	0.0007	1.0414	0.0090	0.0021
2	4,6	0.0130	0.0031	0.0008	1.0390	0.0093	0.0024
3	5,4	0.0146	0.0031	0.0008	1.0438	0.0093	0.0024
4	5,5	0.0146	0.0035	0.0007	1.0438	0.0105	0.0021
5	5,6	0.0137	0.0031	0.0007	1.0411	0.0093	0.0021
6	6,4	0.0149	0.0032	0.0008	1.0447	0.0096	0.0024
7	6,5	0.0145	0.0028	0.0008	1.0435	0.0084	0.0024
8	6,6	0.0141	0.0031	0.0008	1.0423	0.0093	0.0024
9	7,4	0.0150	0.0032	0.0008	1.0450	0.0096	0.0024
10	7,5	0.0147	0.0031	0.0008	1.0441	0.0093	0.0024
Average		0.0143	0.0031	0.0008	1.0429	0.0094	0.0023

Mean of average BAFo per particle:	1.0429
Standard deviation of average BAFo per particle:	0.0019

Comments

G. E. Jellison — Operator

12/16/09 — Date

Appendix A: Certificate of Conformance

This section contains the Certificate of Conformance for the LEU09-OP2-Z compact lot, This is a record of the review by Quality Assurance personnel that specified requirements have been met or that nonconformances to those requirements have been documented. Appendix B contains copies of the applicable Nonconformance Reports.

Oak Ridge National Laboratory ORNL/TM-2010/017

Advanced Gas Reactor Fuel Development and Qualification Program

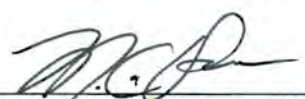
CERTIFICATE OF CONFORMANCE

1. ITEM IDENTIFICATION: AGR Fuel Compacts
2. PART LOT AND LOT NUMBER: AGR-2 UCO Variant, LEU09-OP2-Z
3. PRODUCT DEFINITION: INL Document #SPC-923, Revision 3 entitled *AGR-2 Fuel Specification*
4. LIST OF APPROVED DEVIATIONS: Not applicable

*Part Type	Unique Part I.D. No.	QTY	INIT.	Date	*Part Type	Unique Part I.D. No.	QTY	INIT.	Date
FC	002	1			FC	089	1		
FC	004	1			FC	092	1		
FC	005	1			FC	100	1		
FC	014	1			FC	102	1		
FC	015	1			FC	103	1		
FC	016	1			FC	104	1		
FC	017	1			FC	105	1		
FC	018	1			FC	112	1		
FC	022	1			FC	114	1		
FC	026	1			FC	119	1		
FC	028	1			FC	124	1		
FC	038	1			FC	125	1		
FC	040	1			FC	126	1		
FC	043	1			FC	127	1		
FC	049	1			FC	128	1		
FC	053	1			FC	129	1		
FC	056	1			FC	130	1		
FC	057	1			FC	131	1		
FC	059	1			FC	132	1		
FC	062	1			FC	134	1		
FC	063	1			FC	135	1		
FC	066	1			FC	139	1		
FC	069	1			FC	141	1		
FC	075	1			FC	142	1		
FC	077	1			FC	153	1		
FC	079	1			FC	154	1		
FC	082	1			FC	156	1		
FC	083	1			FC	158	1		
FC	085	1			FC	165	1		
FC	088	1			FC	167	1		

5. LIST OF APPLICABLE NONCONFORMANCE REPORT NUMBERS (NCRs attached in Appendix B of data package): INL NCR 44791

With the exception of the Deviations documented on the forms referenced in Item 4 and the nonconforming conditions documented on Nonconformance Reports referenced in Item 5, the listed parts have been produced and tested in compliance to the requirements of the QAP for the AGR Program at ORNL (Document # QAP-ORNL-AGR-01), its subordinate implementing procedures, and to the specified product definition prescribed in the document(s) referenced in Item 3.



2/11/10

M. C. Vance, AGR Quality Representative, Materials Science and Technology Division, ORNL — Date

* FC indicates fuel compact

Appendix B: Nonconformance Reports

This section contains the applicable Nonconformance Reports for the LEU09-OP2-Z compact lot. A nonconformance related to a higher than allowed fraction of exposed uranium was determined by the program to be acceptable for the AGR-2 irradiation test. The exposed uranium was due to cracked TRISO layers in the coated particle composite. These cracks are thought to have occurred at B&W when particles were removed from the coating furnace using a suction device. The final disposition of this compact lot was to use as is for the AGR-2 irradiation test. This disposition was documented on INL NCR-44791.

230.01
Revision date
09/30/2003

Control of Nonconforming Items
Nonconformance Documentation

Initiator:	S Number:	Work Org.:	Work Phone:
Barnes, Charles M	059914	C700	6-0864

Documentation

NCR Number:	Date Identified:	*SSC:	*Facility:OFF-S
44791	08/04/2009	AGR-2 compacts and coated particles	*Location:ORNL Description:Bldg 4508 and possibly other ORNL buildings

*Item Name:	Req. No/P.O. No./SC and/or Project No.:
LEU06 compacts containing B&W G73J-14-93074A particles and other AGR-2 compact lots (LEU07 and possibly LEU09 and/or LEU11) containing B&W AGR-2 particles	Project #23841; Contract #27240 with B&W for Industrial fuel fabrication and development; Contract 59613 with ORNL which includes AGR compact fabrication and characterization
Supplier Name/Address: Supplier of AGR-2 particles is Babcock & Wilcox Co., 1570 Mt. Athos Road, Lynchburg, VA 24504	*This NCR is for: ☐ ICP ☒ INL ☐ Other

*Is the non-conformance under the requirement of SNF or NRC-licensed activities (DOE/RW-0333P)? ○ Yes ● No

*Specification to which Item does not perform:

SPC-923, Rev. 2 AGR-2 Fuel Specification (in effect when AGR-2 UCO particle data package was submitted by B&W) and SPC-923, Rev 3 (in effect when LEU06 and other AGR-2 compacts were characterized)

Associated Documents:
Data Packages for LEU06, LEU07, LEU09 and LEU11 compacts (not issued at this time); B&W Data Packages for AGR-2 UCO particles, lots G73J-14-93071A, G73J-14-93072A, G73J-14-93073A, G73J-14-93074A & G73H-10-93085B; TCT meeting notes of March 2 & 5 teleconferences, March 16 & 18 teleconferences, and April 2 teleconference

*Non-Conformance Description:

LEU06 compacts were found to contain uranium contamination at approximately 10-4 g exposed U per gram total U in compacts, compared to the specification of ≤ 2x10-5 g exposed U per g U in compacts. Exposed uranium in compacts was determined to be caused by cracks through all layers of the coatings of a fraction of particles contained in these compacts. Based on several teleconferences of the VHTR TDO Fuels Technical Coordination Team (held on March 2, 5, 16, 18 and April 2), it was recommended that LEU06 compacts not be used in the AGR-2 experiment because of the high uranium contamination but replaced by a new set of compacts containing G73J-14-93073A particles. This replacement batch of compacts is expected to have a lower fraction of uranium contamination (44% of the LEU06 fraction based on all leach and burn leach results and 95% confidence values or 33% based on all leach and burn leach results and 50% confidence values). LEU07 compacts were also found to have uranium contamination above the specification limit, although for a separate reason (uranium dispersion), LEU07 compacts have been rejected for use in the AGR-2 experiment. The actual uranium contamination values for LEU06 compacts are ≤1.4E-4 (95% confidence based on analysis of 40 compacts only) for LEU06 and ≤6.9x10-5 (95% confidence based on analysis of 100 compacts) for LEU07 compacts. The expected value for LEU09 compacts is 5x10-5 (95% confidence), based on measurements of defect fractions of 217,000 particles from batch 93073A.

*Responsible Manager (RM):	*Responsible Quality Engineer (QE):
Cox, John R Alternate RM for processing NCR: Croson, Diane V	Roberts, Gary D

Next Activity: Implementation Completion - RM
Actionee: Croson, Diane V
Date Due:

Screening - Responsible Manager

Responsible Manager (RM):	Organization	Phone:	Date Screened:
Croson, Diane V	C700	6-3402	12/08/2009

*Initiator has selected "No" to the non-conformance under the requirement of SNF or NRC-licensed activities

(DOE/RW-0333P). Is this Correct?
● Yes ○ No

*Does the NCR require Stop Work?
○ Yes ● No

*Does this NCR support Environmental Requirements? ○ Yes ● No

RM Comments:
None

RM Change History:
12/08/2009 07:26 AM : Angela J Smith changed the RM from Cox, John R to Croson, Diane V

Screening - Quality Engineer

Quality Engineer (QE):	Organization	Phone:	Date Screened:
Roberts, Gary D	W560	6-8961	12/08/2009

*Is the NCR valid? ● Yes ○ No

Quality Comments:
None

Notification - RM

Responsible Manager (RM):	Organization	Phone:	Date Notified:
Croson, Diane V	C700	6-3402	12/08/2009

ORPS Report Number:
N/A

*Is the NCR operational equipment needed for Conditional Use?
○ Yes ● No

*Area of Responsibility:
INL NGNP

Optional Internal Area of Responsibility:

Cognizant Director:
Soto, Rafael
Cognizant Director's Alternate(s):
Smith, Angela J; Armour, Kimberly Jo

*Facility Manager:
Petti, David A

Compliance Coordinator(s) to determine Price Anderson (PAAA) noncompliance:
Smith, Angela J

*Does the non-conformance involve suspect/counterfeit items?
○ Yes ● No

*Does this NCR pertain to Waste Containers, Waste Packaging, or Packaging and Transportation activities? ○ Yes ● No

Method of Segregation:
Material is located at ORNL and is segregated from other fuel batches to prevent inadvertant use

Method of Identification:
Clearly lable by batch number

*Lead Disposition Evaluator:
Barnes, Charles M
Additional Disposition Evaluator(s):
(These evaluators verify and concur the disposition of NCR.)

This block is intentionally left blank.

Additional Notification:

QE Red Tag Process

Quality Engineer (QE):	Organization	Phone:	Date Processed:
Roberts, Gary D	W560	6-8961	07/30/2009

Tagging Information/Other Methods:

Other means of Tag Identification:

Disposition

Lead Disposition Evaluator:	Organization:	Phone:	Date Disposition sent for approval:
Barnes, Charles M	C700	6-0864	12/08/2009

*NCR Disposition:
○ Use As Is ○ Reject
○ Repair ● Multiple Disposition
○ Rework

*Multiple Disposition Documentation:
1. LEU06 and LEU07 compacts: Do not use for AGR-2 fuel because of high uranium contamination. However, because full characterization has been performed on these compacts and the kernels and coated particles that they contain, LEU06

	compacts should be retained in storage at INL and ORNL for possible future uses. These uses include measurement of thermal conductivity or other compact properties, tests of PIE methods, and tests to better determine fuel specification limits. 2. LEU09 and LEU11 compacts: Use as is. See justification below.
*Does Disposition represent Design Change? ○ Yes ● No	*Does this item require a Unreviewed Safety Question (USQ) screening and evaluation? ○ Yes ● No

Identify as-built drawings and other documentation:(*For Use-As-Is and Repair)
N/A

Method of Disposal:(*For Reject)
N/A

Technical Justification:(*For Use-As-Is and Repair)
Justification for use as is for LEU09 and LEU11 compacts: Uranium equivalent to 2 defective particles has been found in 60 LEU09 compacts; this level is low enough to permit use of these compacts in the AGR-2 experiment, although the level may not meet the fuel uranium contamination specification limit. The final determination of whether LEU09 compacts meet the uranium contamination specification will be made after analyses are complete of another 40 compacts. No uranium contamination has been found in the analysis of 40 LEU11 compacts. 60 additional LEU11 compacts are being analyzed. Past analyses of multiple sets of 20 compacts show very little variation in results from one set to the next because of the large number of particles in each set of 20 compacts.

Technical requirements and acceptance criteria to be used for repair work:
N/A

Inspections and Verification Criteria for acceptability of repair or rework:
N/A

Other Documents or QA records requiring the change:
N/A

If this nonconforming item is associated with, or caused by, a program, procedure, or process problem, document the issue in accordance with LWP-13840:

N/A

Disposition Concurrence/Approval

Approval RM(Signature) Croson, Diane V *Diane V Croson* 12/08/2009	Concurrence/Approval QE(Signature) Roberts, Gary D *Gary D Roberts* 12/08/2009	This block is intentionally left blank.	This block is intentionally left blank.

Implementation Completion - RM

Responsible Manager (RM): Croson, Diane V	Organization C700	Phone: 6-3402	Date Completion:

The Disposition as approved has been completed and implemented: ○ Yes ○ N/A

Implementing Documentation:

Attachments/Comments

PAAA 44791 (AGR-2 compacts).pdf

Revision History

12/08/2009 04:30 PM : Diane V Croson as an RM concurred the Disposition and signed off.
12/08/2009 04:20 PM : Gary D Roberts as a QE concurred the Disposition and signed off.
12/08/2009 02:37 PM : Charles M Barnes completed NCR Disposition and submitted to Croson, Diane V; Roberts, Gary D for their concurrence and approval.
12/08/2009 07:52 AM : Diane V Croson completed Notification Process and notified Roberts, Gary D; Soto, Rafael; Smith, Angela J; Armour, Kimberly Jo; Smith, Angela J; Petti, David A; Barnes, Charles M
12/08/2009 07:44 AM : Gary D Roberts completed screening and forwarded to Croson, Diane V for Notification process.
12/08/2009 07:34 AM : Diane V Croson completed screening and forwarded to Roberts, Gary D for QE Screening.
12/08/2009 07:26 AM : Angela J Smith changed the RM from Cox, John R to Croson, Diane V
08/04/2009 03:26 PM : Charles M Barnes submitted NCR to RM Cox, John R for screening.

The following fields are general purpose public use. Any data entered here is not related to NCR process and solely used for one's individual need. Integrity of the data is not guarantied since it can be replaced by any user randomly.

FIELD A:

(Field Name: FIELDA, type Text)

FIELD B:

(Field Name: FIELDb, type Text)

Appendix C: Upgrading of LEU09 using a Roller-micrometer

As discussed in section 3, a TRISO particle sample was taken from coated particle batch G73J-14-93073A, upgraded using a roller-micrometer, and renamed LEU09. LEU09 was used to make the AGR-2 B&W UCO compact lot LEU09-OP2-Z.

The roller-micrometer technique uses rotating inclined cylinders with a diverging gap to sort particles according to their size. Using a vibrating vee-trough feeder, particles are fed in a single stream into the gap between the rollers. The rollers are angled downward away from the feed point and rotate with an upward and outward motion. Particles travel down the gradually widening gap until they reach a point equal to their width, at which point they drop through the gap into a series of collection bins. The roller-micrometer is a very accurate and reliable device for sorting coated particles by size. It also tends to sort coated particles by shape because the particles continuously re-orient as they travel down the inclined rollers, and faceted particles fall through a narrower gap than spherical particles of the same diameter. Figure C-1 shows the roller-micrometer equipment.

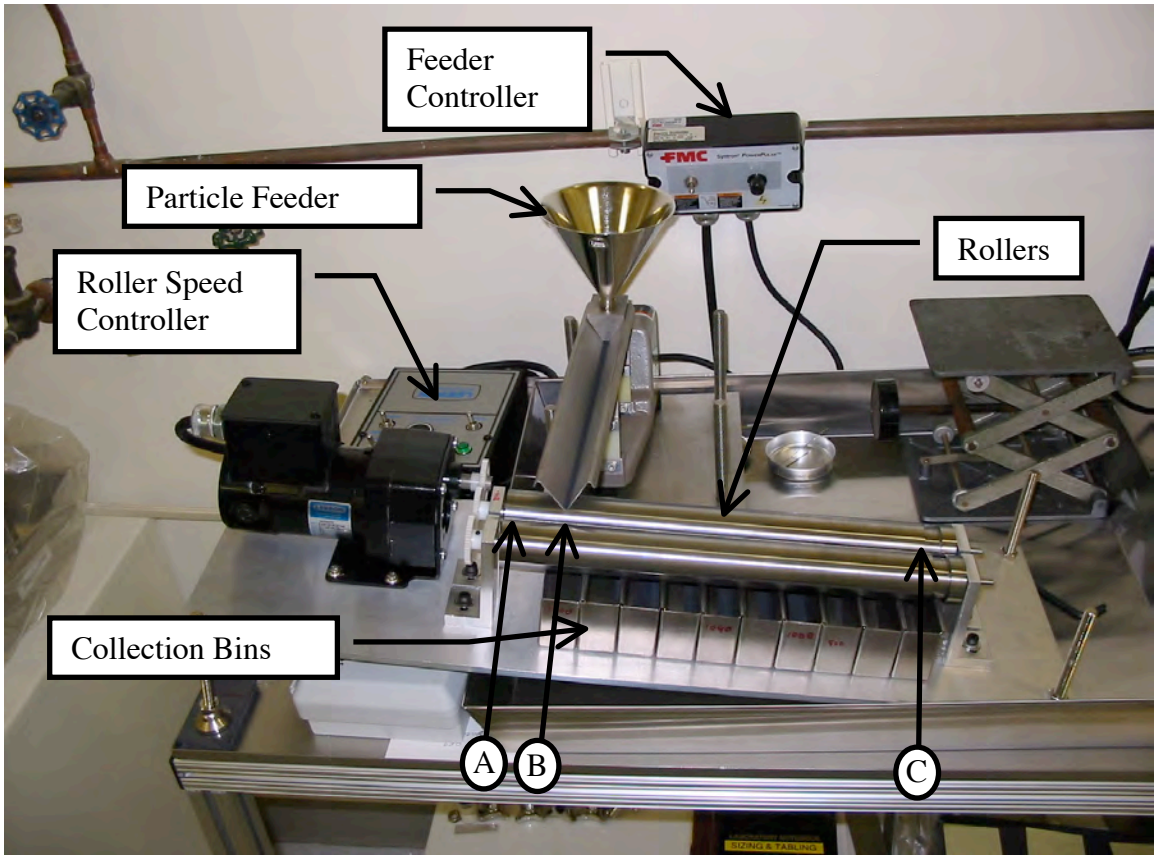


Figure C-1. Photograph of roller-micrometer equipment showing the arrangement of the roller, particle feeder, and collection bins.

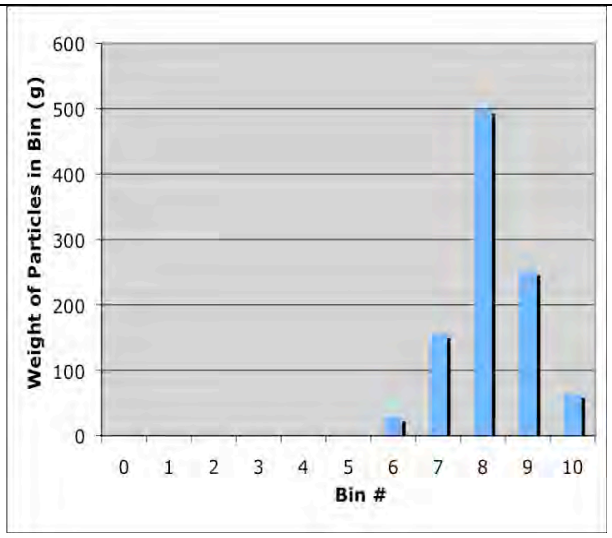
The roller gap was adjusted such that particles could be sorted into 11 bins numbered consecutively from 0 to 10. Each bin spanned a gap width variation of 25 μm, with Bin 0 at 650 -

675 μm and Bin 10 at 900 μm and above. Table C-1 shows the distribution of the particles after passing through the roller-micrometer. No uncoated kernels or coating fragments were found. Bin 4 contained 14 small or non-spherical particles (Figure C-2). These particles were set aside. Bin 5 contained ~1600 particles (about 0.16% of the total population), and some of these particles also exhibited non-spherical shapes (Figure C-3). These particles were not discarded for reasons discussed below. Note that there is also a weight loss reported in Table C-1 due to removal of carbon dust from the surface of the OPyC and a few particles that bounced off of the rollers during sorting.

Bins 5 - 10 were recombined and the upgraded composite was named LEU09. This decision was based on the fact that the purpose of the roller micrometer upgrading was to separate out and remove uncoated kernels, not to remove the tails of the particle size distribution. The selective removal of the 14 particles in Bin 4 is not expected to impact the results of previously performed sampling and acceptance testing of the kernels and coated particles that went into LEU09. However, further upgrading by removal of Bin 5 or Bin 10 could change the mean properties of the composite to a degree where some of the previous QC data would no longer be relevant. In addition, there is no evidence that the particles in the tails of the roller-micrometer distribution will not perform adequately. Previous observation of undersized particles from a similar coating batch (G73H-10-93087) showed no indication of missing layers and the small diameter was most often related to a thin buffer or, in a few cases, a thin OPyC. Therefore, it was determined by the program that it was desirable to proceed with the irradiation testing of the coated particles as produced by the current B&W process that did not include roller-micrometer sorting.

Table C-1. Sorting of LEU09 by roller-micrometer

Collection Bin	Nominal Gap (µm)	Weight (g)
Bin 0	650 - 675	empty
Bin 1	675 - 700	empty
Bin 2	700 - 725	empty
Bin 3	725 - 750	empty
Bin 4	750 - 775	0.0127
Bin 5	775 - 800	1.6424
Bin 6	800 - 825	27.8240
Bin 7	825 - 850	155.1263
Bin 8	850 - 875	498.5089
Bin 9	875 - 900	251.1759
Bin 10	900 - open	63.6082
	Total	997.8984
	Loss	1.9994



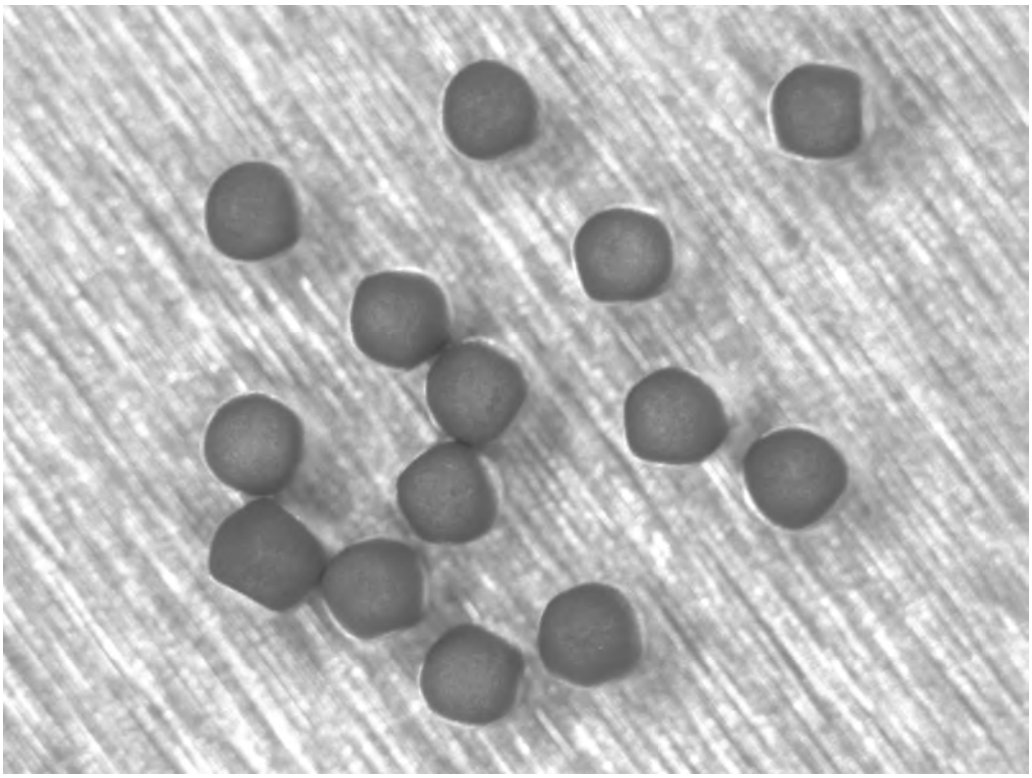


Figure C-2. Photograph of particles from Bin 4.

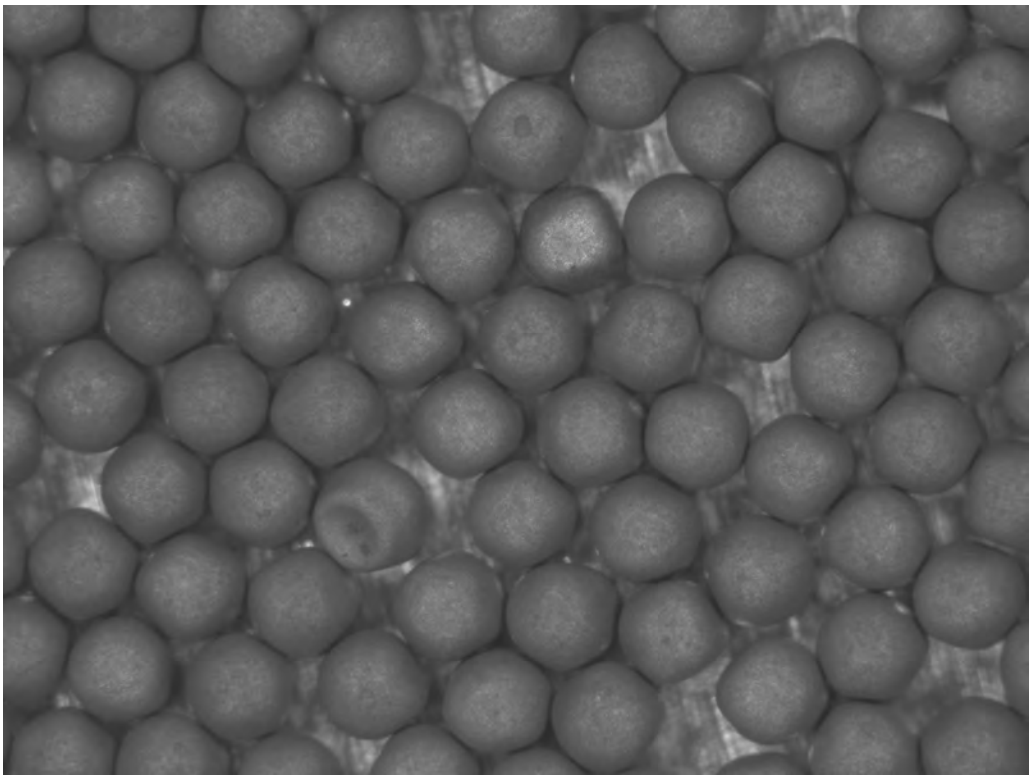


Figure C-3. Photograph of fragment from Bin 5.