1 FERRITIC/MARTENSITIC STEEL DEVELOPMENT

1.1 DEVELOPMENT OF CASTABLE NANOSTRUCTURED ALLOYS AS 1 ADVANCED RAFM STEELS-L. Tan, and Y. Katoh (Oak Ridge National Laboratory), L.L. Snead (Stony Brook University) 1.2 MECHANICAL PROPERTY EVOLUTION OF RAFM STEELS NEUTRON-3 IRRADIATED UP TO 80 DPA-Kun Wang, Kevin G. Field, Lizhen Tan, Xiang Chen, Josina W. Geringer, Yutai Katoh (Oak Ridge National Laboratory), Hideo Sakasegawa, Hiroyasu Tanigawa, Takanori Hirose (National Institutes for Quantum and Radiological Science and Technology) 1.3 PRELIMINARY ANALYSIS OF AN UPDATED IRRADIATION HARDENING 9Cr 8 TEMPERED MARTENSITIC STEEL DATABASE-T. Yamamoto, Y. Wu, G. R. Odette (University of California, Santa Barbara) 1.4 MICROSTRUCTURE BASED PREDICTIONS OF HARDENING IN Fe - 3- to 17 18%Cr BINARY MODEL ALLOYS IRRADIATED IN THE ATR REACTOR-T. Yamamoto, P. Wells, G. R. Odette (University of California, Santa Barbara), D. Bhattacharyya (Australian Nuclear Science and Technology Organization) 1.5 WELD PROPERTY EVALUATION OF MODIFIED 3Cr-3WVTa BAINITIC 25 **STEEL**—Y. Yamamoto (Oak Ridge National Laboratory) FATIGUE PRECRACKING M4CVN TYPE STEEL SPECIMENS FOR THE 30 1.6 EUROFusion PROJECT—X. Chen, R.L. Swain, E.T. Manneschmidt, K.D. Linton, Y. Katoh (Oak Ridge National Laboratory) 2 ODS AND NANOCOMPOSITED ALLOY DEVELOPMENT 2.1 BASELINE APT STUDIES OF UNIRRADIATED 14YWT ARCHIVE FOR THE IN-34 SITU HELIUM INJECTION EXPERIMENT—Karen Kruska, Danny Edwards, Richard J. Kurtz (Pacific Northwest National Laboratory) 2.2 VISCOPLASTIC SELF-CONSISTENT MODELING OF DEFORMATION 39 PROCESSING A 14YWT NANOSTRUCTURED FERRITIC ALLOY-S. Pal. M. E. Alam, G. R. Odette (University of California Santa Barbara) 3 **CERAMIC COMPOSITE STRUCTURAL MATERIAL DEVELOPMENT** 3.1 MECHANICAL PROPERTY DEGRADATION OF HIGH CRYSTALLINE SIC 53 FIBER-REINFORCED SIC MATRIX COMPOSITE NEUTRON IRRADIATED TO ~100 DISPLACEMENTS PER ATOM -IRRADIATED 3C-SIC—Takaaki Kovanadi. Yutai Katoh (Oak Ridge National Laboratory), Takashi Nozawa (National Institutes for Quantum and Radiological Science and Technology), Lance Snead (Stony Brook University) 3.2 DIMENSIONAL STABILITY AND ANISOTROPY OF SIC AND SIC-BASED 54 COMPOSITES IN TRANSITION SWELLING REGIME-Yutai Katoh, Takaaki Koyanagi, Joel McDuffee (Oak Ridge National Laboratory), Lance Snead (Massachusetts Institute of Technology), Ken Yueh (Electric Power Research Institute)

- **3.3 WIGNER ENERGY IN SILICON CARBIDE**—Lance Snead (Stony Brook University) Takaaki Koyanagi, Yutai Katoh and Kurt Terrani (Oak Ridge National Laboratory)
- 3.4 MICROSTRUCTURAL EVOLUTION OF 3C-SiC EXPOSED TO SIMULTANEOUS
 59 NEUTRON IRRADIATION AND HELIUM IMPLANTATION—X. Hu, T. Koyanagi,
 Y. Katoh (Oak Ridge National Laboratory), J. Zhao (Lanzhou University), T.
 Yamamoto (University of California, Santa Barbara)
- 3.5
 PRECIPITATES AND VOIDS IN CUBIC SILICON CARBIDE IMPLANTED WITH
 73

 ∞Mg+ IONS—Weilin Jiang, Steven R. Spurgeon, Jia Liu, Daniel K. Schreiber, Hee
 Joon Jung, Arun Devaraj, Danny J. Edwards, Charles H. Henager Jr., Richard J.
 Kurtz (Pacific Northwest National Laboratory), and Yongqiang Wang (Los Alamos National Laboratory)

4 HIGH HEAT FLUX MATERIALS AND COMPONENT TESTING

- 4.1 TEM CHARACTERIZATION OF MULTIMODAL PRECIPITATES IN NOVEL 76 COPPER ALLOYS FOR FUSION ENERGY APPLICATIONS—Ying Yang (Oak Ridge National Laboratory), Ling Wang (University of Tennessee at Knoxville), Steven J. Zinkle (University of Tennessee at Knoxville and Oak Ridge National Lab), and Lance Snead (Stony Brook University)
- **4.2 NEUTRON IRRADIATION EFFECTS IN TUNGSTEN**_L.M. Garrison, Y. Katoh **80** (Oak Ridge National Laboratory)
- 4.3
 NEUTRON
 IRRADIATION
 EFFECTS
 IN
 TUNGSTEN-COPPER
 85

 COMPOSITES—L.M. Garrison, Yutai Katoh (Oak Ridge National Laboratory)
- 4.4 ON THE FRACTURE BEHAVIOR OF WNIFe HEAVY METAL ALLOY 90 HYBRIDS—M.E. Alam, G. R. Odette (University of California Santa Barbara)
- 4.5
 HIGH-HEAT FLUX TESTING OF LOW-LEVEL IRRADIATED MATERIALS
 97

 USING PLASMA ARC LAMPS—A.S. Sabau, Y. Katoh (Oak Ridge National Laboratory)
 97
- 5 **MAGNETIC AND DIAGNOSTIC SYSTEM MATERIALS** No contributions this reporting period.
- 6 FUSION CORROSION AND COMPATIBILITY SCIENCE
- 6.1 LIQUID METAL COMPATIBILITY IN STATIC Li, Sn and Sn-Li—J. Jun and B. A. 101 Pint (Oak Ridge National Laboratory)
- 6.2 LIQUID METAL COMPATIBILITY IN FLOWING SYSTEMS—J. Jun and B. A. Pint (Oak Ridge National Laboratory) 106

7 MECHANISMS AND ANALYSIS

 7.1
 HIGH-TEMPERATURE
 NEUTRON-IRRADIATION
 OF
 Ti-BASED
 Mn+1AXn
 114

 PHASES—Matheus
 A. Tunes and Philip
 D. Edmondson
 (Oak
 Ridge
 National

 Laboratory)
 D.
 Edmondson
 (Oak
 Ridge
 National

- 7.2 GENERATION AND INTERACTION MECHANISMS OF PRISMATIC 116 DISLOCATION LOOPS IN FCC METALS—Can Erel, Giacomo Po, Tamer Crosby, and Nasr Ghoniem (University of California, Los Angeles)
- 7.3
 DEPENDENCE OF HARDENING AND SATURATION STRESS IN PERSISTENT
 118

 SLIP BANDS ON STRAIN AMPLITUDE DURING CYCLIC FATIGUE
 LOADING—Can Erel, Giacomo Po, and Nasr Ghoniem (University of California, Los Angeles)
 118
- 7.4TOWARDSBEND-CONTOUR-FREEDISLOCATIONIMAGINGVIA120DIFFRACTIONCONTRASTSTEM—YuanyuanZhu, DannyEdwards, MychailoToloczko, Richard J. Kurtz (Pacific Northwest National Laboratory), and ColinOphus (Lawrence Berkeley National Laboratory)

8 MODELING PROCESSES IN FUSION SYSTEM MATERIALS

- 8.1 RADIATION EFFECTS ON COHERENT PRECIPITATES IN BINARY Cu-1%Co 122 ALLOYS—Ling Wang and Steven J. Zinkle (University of Tennessee, Knoxville)
- 8.2
 DEVELOPMENT OF INTERATOMIC POTENTIALS IN TUNGSTEN-RHENIUM
 127

 SYSTEMS—W. Setyawan and R. J. Kurtz (Pacific Northwest National Laboratory),
 N. Gao (Institute of Modern Physics, Chinese Academy of Science, China)
 127
- 8.3
 OKMC STUDY OF DEFECT ACCUMULATION IN TUNGSTEN AT ROOM
 130

 TEMPERATURE DUE TO RADIATION CORRESPONDING TO PKA SPECTRA
 OF 14-MeV-NEUTRON AND HIGH-FLUX ISOTOPE REACTOR (HFIR)—G.
 130

 Nandipati, W. Setyawan, K. J. Roche, R. J. Kurtz (Pacific Northwest National Laboratory) and B. D. Wirth (University of Tennessee)
 130
- 8.4 MODELING DUCTILE-PHASE TOUGHENED TUNGSTEN FOR PLASMA-FACING MATERIALS: PROGRESS IN DAMAGE FINITE ELEMENT ANALYSIS OF TUNGSTEN-COPPER BEND BAR TESTS—B.N. Nguyen, C.H. Henager, Jr., N.R. Overman, R.J. Kurtz (Pacific Northwest National Laboratory)
- 8.5 MODELING THE EFFECTS OF HELIUM BUBBLES ON THE STRESS-STRAIN 139 BEHAVIOR OF IRON GRAIN BOUNDARIES BY A MECHANISTIC FINITE ELEMENT APPROACH USING MOLECULAR DYNAMICS DATA—B.N. Nguyen, R.J. Kurtz (Pacific Northwest National Laboratory), and F. Gao (University of Michigan)
- 8.6 MECHANICAL PROPERTIES AND RADIATION EFFECTS IN FUSION 145 MATERIALS—Yury Osetskiy (Oak Ridge National Laboratory)
- 9 FUSION SYSTEM DESIGN No contributions this reporting period.
- 10 IRRADIATION METHODS, EXPERIMENTS AND SCHEDULES
- 10.1
 STRAIN EVALUATION USING A NON-CONTACT DEFORMATION
 147

 MEASUREMENT SYSTEM IN TENSILE TESTS OF IRRADIATED F82H AND
 9Cr ODS STEELS—H. Sakasegawa, T. Kato, H. Tanigawa, M. Ando (National Institutes for Quantum and Radiological Science and Technology), X. Chen, J.W. Geringer, Y. Katoh (Oak Ridge National Laboratory)
 147

10.2HFIR IRRADIATION EXPERIMENTS—J.P. Robertson, Y. Katoh, J.L. McDuffee,155C. Bryan (Oak Ridge National Laboratory)