

CHARACTERIZATION OF PRECIPITATION IN MA/ODS FERRITIC STEELS

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Mechanically alloyed, oxide dispersion strengthened (MA/ODS) ferritic steels exhibit excellent high-temperature creep and tensile properties. These ODS ferritic steels are attractive for fusion reactor applications because of their potential for higher operating temperatures and also because the dispersed oxide particles may provide a trap for helium. These ferritic alloys are fabricated by mechanically alloying a pre-alloyed Fe, Cr, Y and Ti powder with a small amount of yttria powder. Atom probe tomography has revealed that these MA/ODS alloys contain a high number density of nanometer scale Ti-, Y- and O-enriched particles in the as-processed condition. These particles were found to be extremely resistant to coarsening at temperatures up to 1300°C (0.85 T_m).

Research at the Oak Ridge National Laboratory SHaRE User Center was sponsored by the Division of Materials Sciences and Engineering, U.S. Department of Energy, under contract DE-AC05-00OR22725 with UT-Battelle, LLC.