

6.1 Characterization of Specimens Exposed in a Li Loop — K. A. Unocic, M. J. Lance, and B. A. Pint (*Oak Ridge National Laboratory*)

This is the Abstract for an ICFRM-15 paper submitted for publication in the Proceedings.

A monometallic V-4Cr-4Ti thermal convection loop was run for 2,350 h with a peak temperature of 700°C and Li flow rate of 2-3 cm/s. Specimens of V-4Cr-4Ti exposed in the hot and cold leg were tensile tested in vacuum at 500°C showing an increase in the 0.2% yield and ultimate tensile strengths and a decrease in the serration amplitude with decreasing exposure temperature in the loop. However, only minor changes in ductility were measured. With the higher temperature exposures, there was a decrease in Vickers hardness measured but little change in the grain size. Characterization of the microstructure after exposure at 627°C in the loop showed an increase in the density of Ti- and N-rich grain boundary and matrix precipitates near the specimen surface after exposure corresponding to an increase in the hardness in the near-surface region. Two-layer V/Y₂O₃ coatings on V-4Cr-4Ti substrates also were exposed in the loop and initial room temperature characterization has been conducted.