

HIGH TEMPERATURE X-RAY DIFFRACTION ANALYSIS OF DEFENSE WASTE PROCESSING FACILITY SLUDGES AND SLURRIES

Arthur R. Jurgensen, arthur.jurgensen@srs.gov, David M. Missimer, and Ronny L.
Rutherford

Savannah River National Laboratory, Washington Savannah River Company, Building
773-A, Aiken, SC 29808

The Savannah River Site Defense Waste Processing Facility (DWPF) is immobilizing high level waste sludge through the addition of glass frit and conversion to borosilicate glass. One of the current site goals is to increase the overall waste immobilization rate, which will reduce the number of canisters produced, the associated disposal cost and the amount of time that DWPF and possibly the tank farms will have to operate. High Temperature X-ray Diffraction in-situ (HT-XRD) is being used to rank melt rate by providing dynamic information on both the metastable and stable crystal in-growth and/or dissolution and provide the information to justify or technically defend why one system melts faster or slower than another. The devitrification and high temperature XRD analysis of the glass frits were presented last year. This current study was undertaken to determine the differences in high temperature devitrification kinetics and phase transformations of several sludges, which are the second component of the feed to the melter. Results of this investigation will be presented