

X-RAY FLUORESCENCE (XRF) ANALYSIS OF HANFORD LOW ACTIVITY WASTE SIMULANTS: METHOD DEVELOPMENT

D. M. Missimer, A. R. Jurgensen, R. L. Rutherford
Savannah River National Laboratory, Aiken, SC 29808

The Hanford Tank Waste Treatment and Immobilization Plant (WTP) is evaluating a X-ray Fluorescence (XRF) as a rapid turnaround technique to support the pretreated low activity waste (LAW) stream to the LAW Vitrification Plant. The LAW stream is primarily a liquid supernatant comprised of sodium hydroxide and sodium nitrate. It also contains sulfate, aluminum, potassium, and trace metals. The low activity treated waste will be concentrated along with any LAW vitrification recycle solutions to 5 to 8-M sodium. The target concentration of the treated LAW batch will be defined by the relative concentrations of sodium and sulfate. Each pretreated batch will be transferred to a temporary holding tank, Concentrate Receipt Vessel (CRV), where after analysis, it will be moved to the Melter Feed Preparation Vessel (MFPV). The glass formers will be added in amounts determined by the treated LAW analysis. Because of the limited capacity of the CRV, a turnaround time of < 15-hr is required.

The overall objective of this study was to develop an XRF analytical method that provides rapid turnaround time (<8 hours), while providing sufficient accuracy and precision to determine variations in waste. The results of this research will be presented.