155a Foaming and Antifoaming in Radioactive Waste Pretreatment and Immobilization Processes

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Radioactive waste pretreatment processes usually involve concentrating radionuclides before waste can be immobilized by vitrification. Foaming is observed at various stages of waste processing like the Defense Waste Processing Facility Sludge Receipt and Adjustment process and melter operations. Savannah River National Laboratory (SRNL) has reported severe foaminess in the bench scale evaporation of the Hanford River Project Waste Treatment Plant waste. Excessive foaming in waste evaporators can cause carryover of radionuclides and non-radioactive waste to the condensate system. Foaming in slurries and sludges encountered in radioactive wastes is of immediate concern because of the environmental hazards posed during the safe disposal of radioactive wastes. The foams encountered in radioactive waste treatment and immobilization processes can be characterized as three-phase foams that incorporate finely divided solids but not surfactants. This lecture will highlight research on foaming and antifoaming conducted by us working closely with the SRNL researchers, and supported by the DOE Environmental Management Science Program.