155e Optimization of Ultrafilter Feed Conditions for Hlw Filtration Using Classical Filtration Models

John Geeting, Rich Hallen, and Reid Peterson

Two classical filtration models were evaluated to assess their applicability to test data obtained from filtration of a High Level Waste (HLW) Sludge sample from the Hanford tank farms. One model was then selected for use in evaluation of the optimal feed conditions for maximizing filter throughput for the proposed Waste Treatment Plant (WTP) at the Hanford site. This analysis indicates that an optimal feed composition does exist, but that this optimal composition is different depending upon the product (permeate or retentate) that is to be maximized. A basic premise of the WTP design had been that evaporation of the feed to 5 M Na (or higher if possible) was required to achieve optimum throughput. However, these results indicate that optimum throughput from a filtration perspective is achieved at lower sodium molarities (either 3.5 M for maximum Low Activity Waste (LAW) throughput or 4.9 M for maximum HLW throughput).