538a Ionic Liquids in Actinide and Fission Product Separations: Progress and Prospects

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Ionic liquids (ILs), particularly those that are liquid at room temperature, have attracted considerable interest as alternatives to conventional organic solvents in a variety of synthetic, catalytic, and electrochemical applications. Increasing attention has recently been devoted to their use in separations, typically as replacements for the organic diluents employed in traditional liquid-liquid extraction or membrane-based separations of organic solutes or metal ions. Although studies of the extraction of metal ions into various ILs (e.g., N,N'-dialkylimidazolium salts) indicate that these solvents frequently provide extraction efficiencies far greater than those obtained with conventional solvents, other work suggests that they suffer from various drawbacks that could limit their utility as extraction solvents. In this presentation, we evaluate the viability of ionic liquids as the basis for extraction systems for the separation of actinides and fission products from acidic media and consider approaches by which their limitations may be overcome.