

Solvent Extraction of Sr^{2+} and Cs^{+} Based on Hydrophobic Protic Ionic Liquids

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A series of new hydrophobic and protic alkylammonium ionic liquids with bis(trifluoromethylsulfonyl)imide or bis(perfluoroethylsulfonyl)imide as conjugated anions was synthesized in a one-pot reaction with a high yield. In essence our synthesis method involves the combination of neutralization and metathesis reactions. Some of these hydrophobic and protic ionic liquids were liquids at room temperature and therefore investigated as new extraction media for separation of Sr^{2+} and Cs^{+} from aqueous solutions. An excellent extraction efficiency was found for some of these ionic liquids using dicyclohexano-18-crown-6 and calix[4]arene-bis(*tert*-octylbenzo-crown-6) as extractants. The observed enhancement in the extraction efficiency can be attributed to the greater hydrophilicity of the cations of the protic ionic liquids. The application of the protic ionic liquids as new solvent systems for solvent extraction opens up a new avenue in searching for simple and efficient ionic liquids for tailored separation processes.

Key words: Protic Ionic Liquids; Solvent Extraction; Crown Ethers.