Properties of Ionic Salts in Supercritical CHF_3-CH_3OH Mixtures

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The dielectric constant and the molar conductivity of solutions of the ionic salt tetrabutylammonium tetraphenylborate (TBATPB) in supercritical mixtures of CHF_3-CH_3OH were measured with a high-pressure coaxial capacitor at 308 K and 323 K, and pressures up to 15 MPa. The formation of a second phase was explored in the capacitor and compared with independent measurements. The solubility of CH_3OH in CHF_3 and the solubility of TBATPB in CHF_3-CH_3OH mixtures were measured by UV spectroscopy or constant pressure sampling followed by chemical analysis. The density of the mixtures was measured by a vibrating tube densimeter as a function of composition.

The dielectric constant of the mixture was analyzed using different theories, while the conductivity was described in terms of ionic mobilities and ionic speciation.