Infrared Radiation Spectra of Oxyhydril Groups in MCl (M = Na, K, Cs) and UO₂Cl₂ - CsCl mixed Melts

Khokhryakov A.A., Khokhlova A.M.

1 IM UD RAS; Russia, Ekaterinburg

2 IHTE UD RAS; Russia, Ekaterinburg, S. Kovalevskaya St., 20 Build; e-mail: bal@ihte.uran.ru

Oxides and hydroxides are the most disseminated impurities in alkali metal halide melts, complicating chemical and electrochemical processes in such systems.

Infrared radiation spectra were measured to show that water molecules and hydroxide ions in MCl (M=Na, K, Cs) and UO₂Cl₂-CsCl melts produce hydrogen bonds of various energy. For $m=\frac{[\text{CsOH}]}{[\text{UO}_2\text{Cl}_2]}<2.84$, molten alkali metal chlorides produce two types of uranyl complexes. These complexes have identical composition, but their hydrogen bonds with the medium are different. For $m>2.84$, complexes UO₂U(OH)₃(H₂O)₀, where I and II refer to water molecules of the first and second coordination spheres exist in chloride melts.