

# Effect of Melt Composition on the Reaction of Uranium Dioxide with Hydrogen Chloride in Molten Alkali Chlorides

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Z. Naturforsch. **62a**, 671 – 676 (2007); received May 21, 2007

*Presented at the EUCHEM Conference on Molten Salts and Ionic Liquids, Hammamet, Tunisia, September 16 – 22, 2006.*

The reaction of uranium dioxide with excess hydrogen chloride in alkali chloride melts (LiCl, 3LiCl-2KCl, NaCl-KCl and NaCl-2CsCl) has been studied between 450 and 750 °C, and the reaction products were characterized by electronic absorption and X-ray absorption spectroscopy. Uranium(V),  $[\text{UO}_2\text{Cl}_4]^{3-}$ , and uranium(IV),  $[\text{UCl}_6]^{2-}$ , species were formed. They depended upon the temperature and the radius of the alkali cations present. Uranium(V) ions predominated in melts with small cations (LiCl and 3LiCl-2KCl).

*Key words:* Uranium Dioxide; Hydrogen Chloride; Chloride Melts; Spectroscopy.