

Electronic Conductivity of NaCl-KCl Equimolar Melt Containing Eu(III) and Eu(II) Complexes by Electrochemical Impedance Spectroscopy

Sergey A. Kuznetsov^{a,b} and Marcelle Gaune-Escard^b

^a Institute of Chemistry, Kola Science Centre RAS, 14 Fersman Str., 184209 Apatity, Murmansk Region, Russia

^b Ecole Polytechnique, Mecanique Energetique, Technopole de Chateau Gombert, 5 rue Enrico Fermi, 13453 Marseille Cedex 13, France

Reprint requests to M. G.-E.; Fax: +33(0)4 91 11 74 39; E-mail: mge@polytech.univ-mrs.fr

Z. Naturforsch. **61a**, 486–490 (2006); received June 1, 2006

The electronic conductivity of molten equimolar NaCl-KCl containing Eu(III) and Eu(II) complexes was studied by electrochemical impedance spectroscopy. The ratio between electronic and electrolyte resistance as a function of the electrode potential was determined. The electronic conductivity was found to be maximal when the amounts of Eu(III) and Eu(II) are about equal. The electronic conductivity of this melt does not exceed 2.3% of the ionic conductivity. Deviation from the molar ratio $\text{Eu(III)/Eu(II)} = 1$ led to a considerable diminution of the electronic conductivity.

Key words: Complexes of Europium; Cyclic Voltammetry; Impedance Spectra; Equivalent Circuit; Electronic and Ionic Conductivity.