Thermodynamic Characteristics of Samarium and Europium Chlorides in Molten Alkali Metal Chlorides

Alena Novoselova, Vladimir Khokhlov, and Vladimir Shishkin

Institute of High-Temperature Electrochemistry, 20 S. Kovalevskaya Str., 620219, Ekaterinburg, Russia

Reprint requests to Prof. V. K.; Fax: +7 (3432) 745992, Email: head@ihte.uran.ru

Z. Naturforsch. **56 a,** 837–840 (2001); received August 20, 2001

Presented at the NATO Advanced Study Institute, Kas, Turkey, May 4 - 14, 2001.

The formal standard redox potentials of samarium (III)/(II) ($E^{*}_{Sm^{3+}/Sm^{2+}}$) and europium (III)/(II) ($E^{*}_{Eu^{3+}/Eu^{2+}}$) in molten alkali metal chlorides were measured potentiometrically against a reference chlorine electrode. The Gibbs energy changes and equilibrium constants for the reaction $LnCl_{2(l)} + {}^{1}/_{2}\ Cl_{2(g)} \Leftrightarrow LnCl_{3(l)}$ were calculated for the salt systems studied. The effect of the cationic composition of the melt-solvent on the above thermodynamic characteristics is also reported.

Key words: Thermodynamic Stability; Rare Earth Chlorides; Molten Alkali Metal Chlorides; Redox Potentials; Gibbs Energy Changes