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Electrochemical behaviour of curium in chloride melts

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Curium isotopes contained in spent nuclear fuel have a high specific heat rate and long half-life, and they should be recovered from high-level wastes (HLW) and transmuted. Molten chlorides have more high radiation resistance than aqueous and organic media. This fact is of significant importance because curium has a high specific activity. There is not much information about the behaviour of curium in molten chlorides. Data available are referred to the conventional standard potential of curium in the alloy formed with zinc [1] and distribution coefficient between salts and liquid metal phase [2]. Data on thermodynamics of formation for oxygen-containing curium compounds in chloride melts was obtained by authors [3] with using of potentiometric titration. This work is devoted to study of non-oxygen curium compound formation in chloride melts. The following standard electrochemical methods were used: CV, SWV, DPV, chrono potentiometry and dynamic galvanometry.

Dependences of formal standard electrode potential of curium, Gibbs energy change and other parameters on temperature and effective radius of solvent cation were obtained. Also Pourbe diagrams were drawn.

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