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Study of reaction of CmO^{+} and CmOCl formation in chloride melt by spectroscopic method

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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. And, correspondingly, it can be used for partitioning of curium from waste before its vitrification. Data on thermodynamics of formation for oxygen-containing curium compounds in chloride melts was obtained by authors [1] with using of potentiometric titration. This work is devoted to more precise definition of these data by using of spectroscopic method. It is obtained spectrum of Cm^{3+} and CmO^{+} complex in melt NaCl-2CsCl-CmCl_3 at 550, 600 and 650°C over argon atmosphere and different partial pressure of $\text{HCl/H}_2\text{O}$. It is demonstrated appearance of peak for CmO^{+} complex at range of 358nm as a result of three different reactions, leading to formation of oxide ions in melt. Dependences of Cm^{3+} и CmO^{+} concentration on partial pressure of $\text{HCl/H}_2\text{O}$ are obtained. From these experimental data dissociation constants of CmO^{+} and CmOCl are calculated.

1. A.G. Osipenko et al. Study of Reaction of Curium Oxy-Compound Formation in Molten Chlorides// Radiochimica Acta 97, 227-230 (2009).

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