

ELECTROLYTIC PRODUCTION OF RARE-EARTH IN MOLTEN CHLORIDE BATH

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In order to develop a electrolytic production of rare earths, the mechanisms of electrolytic reduction of rare-earthchlorides such as LaCl_3 , NdCl_3 , SmCl_3 and DyCl_3 in molten LiCl-KCl have been investigated by using cyclic voltammetry, chronopotentiometry and impedance spectroscopy techniques. The effects of materials of the working electrodes on the electrochemical response are discussed. Electrode reactions were reversible at the slow sweep rate 1. The electron numbers involved in the each electrode reaction were determined. On the other hand, at higher sweep rates, the electrode reaction was quasi-reversible. LaCl_3 was reduced to metallic La. SmCl_3 was ,however, reduced to SmCl_2 in the electrochemical window of the bath.