Short Communication

Electrochemical Behavior of Tin in Molten LiCl-KCl at 450 °C

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The electrochemical behavior of tin was studied with cyclic voltammetry at glassy carbon electrodes in the fused LiCl-KCl at 450 °C. Metallic tin deposition on the glassy carbon electrode occurs at a potential of around -0.56 V with Ag/AgCl reference electrode. the diffusion coefficient $D_{\text{Sn}^{2+}}$ is determined to be $3.0 \times 10^{-5} \text{ cm}^2 \text{ s}^{-1}$. At higher anodic voltage, Sn^{2+} is oxidised to Sn^{4+} . The average number of electrons was determined to be 2 by using the difference between the peak and half peak potentials. Metallic tin was prepared in potentiostatic mode at -0.7 V versus Ag^+/Ag reference for 4 hours. Mass transport towards the electrode is a simple diffusion process and the diffusion coefficient was calculated. The current efficiency for deposition of Sn was as high as 95%.

Keywords: electrochemical behavior, tin, kinetic parameters, electrolysis

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