Reprocessing of LiH in Molten Chlorides

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LiH was used as inactive material to stimulate the reprocessing of lithium tritiate in molten chlorides. The electrochemical properties (diffusion coefficients, apparent standard potentials) were measured by means of transient electrochemical techniques (cyclic voltammetry and chronopotentiometry). At 425 °C the diffusion coefficient and the apparent standard potential were $2.5 \cdot 10^{-5}$ cm^2 s^{-1} and -1.8 V vs. Ag/AgCl, respectively. For the process design the LiH solubility was measured by means of DTA to optimize the LiH concentration in the molten phase. In addition electrolysis tests were carried out at 460 °C with current densities up to 1 A cm^{-2} over 24 h. These results show that LiH may be reprocessed in molten chlorides consisting in the production of hydrogen gas at the anode and molten metallic lithium at the cathode.

Key words: LiH; Molten Salt; Electrolysis; Hydrogen; Litium.