Electrochemical Synthesis of Mo$_2$C Catalytical Coatings for the Water-Gas Shift Reaction

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Z. Naturforsch. 62a, 647 – 654 (2007); received May 23, 2007


The electroreduction of CO$_3^{2-}$ ions on a molybdenum cathode in a NaCl-KCl-Li$_2$CO$_3$ melt was studied by cyclic voltammetry. The electrochemical synthesis of Mo$_2$C on molybdenum substrates has been performed at 1123 K for 7 h with a cathodic current density of 5 mA cm$^{-2}$. If molybdenum carbide is present as a thin (ca. 500 nm) film on a molybdenum substrate (Mo$_2$C/Mo), its catalytic activity in the water gas-shift reaction is enhanced by at least an order of magnitude compared to that of the bulk Mo$_2$C phase.

Key words: Cyclic Voltammetry; Electrode Processes; Electrochemical Synthesis; Water-Gas Shift Reaction; Catalytic Activity.