

EVALUATION OF ACTIVITY OF DIFFERENT COBALT COATINGS FOR HYDROGEN EVOLUTION REACTION

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This work investigates the activity of different cobalt (Co) coatings for hydrogen evolution reaction (HER). The CoFe, CoNi, CoZn, CoFeMn, and CoFeMo coatings were deposited on a copper (Cu) surface using morpholine borane as a reducing agent. The optimal conditions for the deposition of different cobalt coatings were determined. Scanning electron microscopy images and the elemental composition of the formed composites were obtained. The electrocatalytic properties of the prepared catalysts for HER were investigated by recording linear scan voltammograms in a 1 M KOH solution at a potential scan rate of 5 mV s⁻¹ in a potential range from open-circuit potential (OCP) up to -1.5 V vs. Ag/AgCl/KCl_{sat} at a temperature of 25 up to 75 °C. The all formed composites are catalytically active for the HER. Notably, the highest catalytic hydrogen evolution performance with a Tafel slope of 299 mV dec⁻¹ was obtained using the Co₈₇Fe₈Mo₅ catalyst.