

NICKEL CATALYSTS FOR HYDROGEN GENERATION

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During this work, Ni/Cu, NiCo/Cu, NiMn/Cu, NiCoMn/Cu catalysts were formed using the chemical method of metal deposition. The surface morphology, internal structure and chemical composition of the obtained catalysts were analyzed using field emission scanning electron microscopy, X-ray photoelectron spectroscopy and induced plasma optical emission spectroscopy. It was determined that the prepared coating particles consist of oval-shaped agglomerates with a size of 40 nm to 1.6 μm . The studies of the composition of the catalysts showed that the Ni loading ranges from 59.75 to 475.15 $\mu\text{g}/\text{cm}^2$, Co – 549.5 to 614 $\mu\text{g}/\text{cm}^2$, Mn – 0.06 to 0.745 $\mu\text{g}/\text{cm}^2$. The catalytic properties of the formed catalysts for sodium borohydride hydrolysis reaction were investigated. The two-component NiCo coating was characterized by the highest catalytic activity. It was determined of this catalyst an activation energy of 56.4 kJ/mol and an H₂ evolution rate of 1.24 ml/min at 30 °C and 14.59 ml/min at 70 °C.
