

AUTOCATALYTIC REDUCTION AND CHARACTERISTICS OF BORON-CONTAINING COATINGS

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Abstract: The research results of the plating conditions, chemical composition and properties of Ni-B coatings and Ni-Re-B, Ni-Mo-B and Ni-W-B alloys are given. It was shown that introduction of alloying elements (Re, Mo and W) in the composition of Ni-containing coatings modifies the catalytic activity of the alloys' surface, with regard to the parallel reactions of dimethylamino-borane (DMAB) heterogeneous hydrolysis, Ni reduction and evolving of the molecular hydrogen. It was found that with the increase in concentration of alloying element, boron contents in the coatings is decreased to the trace amounts. The effect of alloys composition on hydrogen evolving overvoltage was studied. Due to the low overvoltage of hydrogen evolving (HE) on the alloy Ni-Re-B surface (11 at.% Re), it can be used as electrode for hydrogen generation from water in the electrolytic cell with novel design and improved technical-economical indicators.

Keywords: autocatalysis, coatings, alloys, hydrogen generation, electrolytic cell.