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INFLUENCE OF THE PHYSICO-CHEMICAL CONDITIONS ON HYDROTHERMAL SYNTHESIS OF Co–Cu AND Co–Cu–Al NANOSYSTEMS

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Hydrothermal synthesis has several advantages (single stage and a high degree of mixing of the reactants, relatively mild conditions of synthesis), and is increasingly used for the synthesis of inorganic materials in a highly dispersed state. In recent years number of publications on the use of such materials as catalysts has increased.

Catalysts containing cobalt oxide or reduced state are well known and are used in many reac-

tions: hydrogen production and the reactions with his participation, such as hydrogenation and obtaining of hydrocarbons according to Fischer – Tropsch synthesis. Intermetallic Co–Ni highly dispersed powders with a particle size of 40–80 nm were prepared earlier [1] by hydrothermal synthesis in hydroalcoholic solutions.

The aim of this investigation is the influence of physico-chemical conditions (temperature, nature of the reductant, etc.) on the synthesis of Co–Cu and Co–Cu–Al systems under hydrothermal conditions. Syntheses were performed in steel autoclaves preferably from stoichiometric mixture of nitrates of these metals in aqueous solutions of formaldehyde and polyols. Ethylenglycol and glycerol were used as polyols. The products of the reaction were characterized using X-ray diffractometer and electron microscope, UV, visible and IR spectroscopy.

It is shown that in the system of Co–Cu–Al at low temperatures in the products of reaction regardless of the nature of the reductant presents metallic copper and cobalt oxalate. With a slight increase in temperature in the case of glycerol in the products of reaction aluminium oxide phase is observed, whereas with the ethylenglycol gibbsite is formed.

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