

HALIDE AND AMMONIA PALLADIUM-COPPER COMPLEXES SUPPORTED ON MODIFIED TRIPOLI IN THE REACTION OF CARBON MONOXIDE OXIDATION

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The catalytic activity of palladium-copper complexes supported on various carriers in the reaction of low-temperature carbon monoxide oxidation with air oxygen depends on their formulation and preparation methods. The work compares the activity of two complicated catalytic compositions i.e. $K_2PdCl_4-Cu(NO_3)_2-KBr/H_2O-Tr$ (A) and $K_2PdCl_4-Cu(NO_3)_2-NH_4OH-KBr-C_2H_5OH/H_2O-Tr$ (B) based on tripoli from Konoplyanskoe deposit (Ukraine) modified with hot water (H_2O-Tr). Preparation of above mentioned compositions was carried out by a method of incipient wetness impregnation (compositions A) and by a method of NH_3 coordination-impregnation in the presence of ethanol (compositions B) followed by their thermal treatment i.e. air drying at 110 °C or calcination at 300 and 600 °C. Figure shows the curves representing time dependences of CO concentration at the

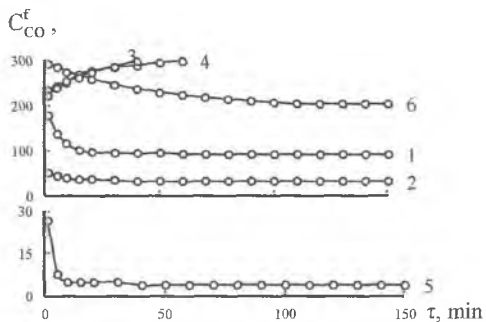


Figure. Time dependences of C_{CO}^f for CO oxidation with air oxygen in the presence of compositions A thermal treated at 110 (1), 300 (2), and 600 °C (3) and compositions B thermal treated at 110 (4), 300 (5), and 600 °C (6)

outlet of the fixed catalyst bed (C_{CO}^f) obtained as a result of testing compositions A and B in the reaction of low-temperature carbon monoxide oxidation with air oxygen. One can see that all kinetic profiles, except for curves 3 and 4, demonstrate the ascertainment of a steady-state mode. C_{CO}^f values for the steady-state mode depend on a formulation of the composition, a method of component supporting, and temperature of the thermal treatment. The optimal temperature of the thermal treatment is 300 °C for both

compositions. However, the maximum level of CO oxidation, 98.6 %, is observed for the catalytic composition B prepared applying ammonia and ethanol. The influence of both an order of reactant mixing and their concentrations in the impregnating solution was investigated in detail. The investigation of all samples by X-ray diffraction, FT-IR spectroscopy, and thermal gravimetry allowed to assume the mechanism of formation of surface palladium-copper complexes.