

RESEARCH

EFFICACY OF APPLICATION OF ZINC OXIDE ON THE SURFACE OF THE NiO/Al₂O₃ CATALYTIC SYSTEM

E. H. El-Mossalamy, S. N. Basahel, and A. Y. Obaid

The surface and catalytic properties of the NiO/Al₂O₃ system after deposition of 3 to 7% zinc oxide on its surface and heat treatment at 400, 600, and 800°C were investigated by X-ray diffraction analysis, nitrogen adsorption at –196°C, and catalytic oxidation of carbon monoxide by oxygen at 150-250°C. It was shown that calcination of the catalyst at 400°C decreases the specific surface area, while it increases it at 600 and 800°C. The decrease in the specific surface area is accompanied by an increase in the size of the NiO/Al₂O₃ crystallites. The activity of the catalysts calcined at 400°C in oxidation of carbon monoxide by oxygen, manifested by a constant reaction rate, increases with an increase in the zinc oxide content on the surface. After deposition of the zinc oxide, the mechanism of the oxidation reaction remains as before, but the concentration of active centers in the catalyst changes.

Key words: *surface area, deposition of zinc oxide, crystallite size, oxidation of carbon monoxide.*