Spectral Investigation of Specific Surface Properties of Active Al_2O_3

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Spectral absorption and EPR studies were carried out to determine the nature of interaction of "acene" molecules with the surface of different samples of Al_2O_3 in chemisorption under vacuum. The results show that for the samples studied specific adsorption bands and EPR signals appear for the adsorbed molecular ions of antracene, tetracene, and perylene. This manifestation of electron-accepting properties by the alumina surfaces is attributed to their chemical nature.

Adsorptive Properties of a Charged Semiconductor

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The changes in the work function and adsorptive capacity of a semiconductor specimen were investigated in the light of the electronic theory of chemisorption. The data obtained were utilized in determining the effect of electric field upon adsorption capacity of the semiconductor. The characteristics of ion adsorption by the semiconductor and consequent changes in the semiconductor properties are discussed.

Study of Kinetics of Heterogeneous Catalytic Reactions in Continuous Flow Systems: Dehydration of Ethyl Alcohol Over Aluminum Oxide

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The rate constant and activation energy were determined for dehydration of ethyl alcohol over alumina in a continuous flow unit. The adsorption coefficients and the heat of adsorption were determined for ethanol and water.

A Detailed Study of Iron Catalysts for Ammonia Synthesis: The Texture and Structure of Doubly-Promoted Coprecipitated Catalysts

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The effect of K_2O addition during different stages of preparation of Fe/Al_2O_3 catalysts by coprecipitation of the hydroxides was determined upon specific surface, specific volume, average pore radius, phase composition, magnetic susceptibility, and ferromagnetic resonance spectra of the catalysts. Addition of K_2O as a secondary promoter doubles the activity of the iron catalysts promoted by Al_2O_3. The optimum concentration of Al_2O_3 in the catalyst is not affected by the added K_2O. The unit volume activities of the coprecipitated catalysts approximate those of the fused catalysts of the same composition.

Infrared Spectroscopic Studies of Interaction of Isopropyl Alcohol with a Ni/Al_2O_3 Catalyst

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Infrared spectroscopic studies of adsorption and desorption of isopropyl alcohol on a Ni/Al_2O_3 catalyst were carried out at temperatures of 20° to 400°. The results show that a multiple complex containing bonds of different types is formed on the catalyst surface. The character of the surface complex changes with the temperature; also, the complex is markedly affected by the surface pretreatment conditions.

Oxygen-Initiated Heterogeneous Catalytic Condensation of Olefins in Presence of Hydrogen: Conversion of Isobutylene

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A study of atmospheric condensation of olefins in presence of hydrogen was carried out at temperatures of 100°–180° over a Co/clay catalyst. The results show that with oxygen as the reaction initiator and in presence of hydrogen, isobutylene polymerizes to liquid products; at the optimum temperatures of 100°–120° the yield is 37%, based on the initial isobutylene charged to the process. The results also show that at a temperature of 100°, water or CO are not effective as the reaction initiators.

The combination-scattering spectral analyses were used to determine the hydrocarbon components of the catalyzate. Based on this information, a hypothesized mechanism for growth of the carbon chains is described.