tions of their strength and structural properties. Determinations of the nature of the acids dissolved in amines leads to the conclusion that in different cases the catalytic action may be due to any, or all, of the following acid forms: free acids; complexes having hydrogen bonds and/or proton donor characteristics; ammonia-substituting ions. It appears that catalytic activity of the first three forms varies with the nature of the acid.

A mechanism is proposed to explain acceleration of the reaction by use of added acids and hydroxyl-containing compounds.

Praseodymium Oxide as Catalyst for Dehydration of Alcohols and Dehydrogenation of Alcohols and Tetralin

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Catalytic activity of praseodymium oxide is greater in dehydrogenation than dehydration of ethyl, n-propyl, isobutyl, and secondary isopropyl alcohols. With the primary alcohols, its dehydrogenation activity increases with increasing molecular weight.

Compared to allylic substituents at a β-carbon atom, those at an α-carbon have greater effect on the activation energies of dehydrogenation and dehydration of alcohols and on the energies of C, H, and O bonding with praseodymium oxide.

Study of Kinetics of Heterogeneous Catalytic Reactions in a Recycle-Continuous Process: Cracking of Cumene Over Aluminosilicate Catalysts

By K. V. Topcheeyeva, B. V. Romanovsky, V. I. Teemoshenko

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A study was made of cracking cumene over two samples of aluminosilicate catalysts which were prepared by different methods. The results show that kinetic parameters of the process investigated depend substantially on the "biography" of the catalysts.

Effect of Manganese Dioxide Pretreatment Temperatures on Rate of Isotopic Oxygen Exchange

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Catalytic activity of several samples of manganese dioxide pretreated in vacuum at temperatures of 350°, 450°, and 550° was determined in the following reactions: isotopic exchange of the catalytic oxygen with molecular oxygen; homomolecular oxygen exchange; oxidation of CO at a pressure of 10 mm Hg and temperatures of 25° to 350°.

Increasing the catalyst pretreating temperature increases its activity in the isotopic oxygen exchange reaction and improves its homogeneity. Within a monolayer, the rate of isotopic oxygen exchange with the oxide oxygen falls off exponentially with the degree of completion. At temperatures below 300°, the oxygen exchange rates are smaller—and the corresponding activation energies are larger—than those of CO oxidation.

The homomolecular exchange of oxygen occurs in a high and a near-room temperature regions. Over freshly-pretreated samples of the catalyst, the rates of homomolecular exchange are greater at 25°–34° than at 200°. The near-room temperature homomolecular rates decrease with increasing time of contact with oxygen and are comparable to the CO oxidation rate.

Adsorption of Krypton on Thermally-Treated Platinum Films

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A study of the effect of thermal pretreatment of platinum films at temperatures of 100°–740° on their adsorptive properties shows that the overall film surface is either increased or remains unchanged. However, the pretreatment improves homogeneity of the surface.

Thermal pretreatment of platinum films on glass at a temperature of 630° increases the surface area; however, subsequent cooling to below a room temperature decreases the area—possibly, due to the competing effects of formation and disappearance of the surface defects, particularly, of the microcracks.

Effect of Non-Stoichiometric Amounts of Sulfur on Activity of Sulfide Catalysts

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Comparisons of the product compositions from hydrogenation of benzene over MoS_2/activated carbon and WS_2 catalysts show that the excess