Study of Catalytic Hydrogenation of 3-Sulfolene

By A. V. Mashkeena, A. V. Hramov, and V. I. Chernov

The Institute of Catalysis of Siberian Division of the Academy of Sciences of U.S.S.R.

Hydrogenation of 3-sulfolene was studied over a nickel-chrome catalyst of high selectivity. Series of correlations were established between several kinetic variables of the reaction. It was found that in hydrogenation of sulfolene the catalyst retains its initial activity over long periods of time.

Structure of Some Silicate Catalysts

By L. G. Karakchieyev and A. D. Makarov

The Institute of Catalysis of Siberian Division of the Academy of Sciences of U.S.S.R.

The structures of silica-alumina, silica-zirconia and silica-magnesia catalysts were determined by the x-ray and infrared spectroscopy methods. The aluminum in the silica-alumina catalysts exhibits four- and six-coordinated configurations. An amorphous chemical substance and a solid solution are formed by the silica-zirconia. The silica-magnesia catalyst contains a crystalline phase resembling talcum and after treatment in an autoclave it forms a crystalline phase of near-serpentine configuration.

Catalytic Properties of Titanium Dioxide and of Its Solid Solutions

By I. S. Sazonova, T. P. Khohlova, G. M. Sooshentzeva and N. P. Keiyer

The Institute of Catalysis of Siberian Division of the Academy of Sciences of U.S.S.R.

Catalytic decomposition of isopropyl alcohol was studied over TiO_2 and over its solid solutions in WO_3 and in Fe_2O_3. These catalytic substances differ from each other in both the electrical conductivity and in activation energy.

Decomposition of the alcohol is primarily by dehydration. A correlation was found to exist between the electrical and catalytic properties. An electronic mechanism is proposed to explain the process of dehydration of isopropyl alcohol.

Effect of Calcination Temperature Upon Catalytic Activity of Oxides of Rare Earth Elements

By L. A. Sazonov and M. G. Logveenienko

The Institute of Catalysis of Siberian Division of the Academy of Sciences of U.S.S.R.

An evaluation was made of catalytic activity of a number of rare earth metal oxides for oxidation of CO. The kinetic oxidation curves for the oxides of metals with variable valency values exhibit a plateau. A correlation exists between pretreatment temperatures and catalytic activity of the oxides of lanthanum, dysprosium, and neodymium.

Differential Heats of Adsorption and Isotherms of Some Alkanes and Naphthenes on Silica Gel

By A. V. Keesielyov and B. A. Frolov

M. V. Lomonosov Moscow State University, Chemistry Department. Far-Eastern Affiliate of the Siberian Division of the Academy of Sciences of U.S.S.R.

The adsorption isotherms and differential heats of adsorption of 2,2,4-trimethyl pentane, cyclopentane, cyclohexane, and methyl cyclopentane were determined, using an adsorption calorimeter equipped with a heat-exchanger to maintain a constant temperature of 20°. The silica gel used had large pores and hydrated surface. The areas occupied by the various adsorbate molecules in the dense monolayer at the surface of each adsorbent were evaluated for each adsorbent from the unit surface area values corresponding to the various packing configurations of the molecules of Van der Waals' dimensions. At small pore-fillage values of the adsorbates of equal number of carbons per molecule, the adsorption and heat of adsorption values decrease in the following order: n-alkanes > isoalkanes > naphthenes. In all cases, the net heats of adsorption are exceedingly small, especially for isooctane and the cyclo-alkanes. For this reason, the transition from the predominant adsorption in the primary layer to a polymolecular adsorption and condensation occurs gradually.

Heats of Adsorption and Isotherms of Vapors of Some Aromatic Hydrocarbons on Silica Gel

By A. V. Keesielyov and B. A. Frolov

M. V. Lomonosov Moscow State University, Chemistry Department. Far-Eastern Affiliate of the Siberian Division of the Academy of Sciences of U.S.S.R.

The adsorption isotherms and differential heats of adsorption of the vapors of benzene, toluene,