tion of alcohol approximate the corresponding apparent values. Qualitatively, the relationship of the bonding energies, which were evaluated, is as follows: $K_{Alc.App.} < K_{Napth.App.} < K_{Olef.App.}$

In dehydrogenation of tetralin and isopropyl alcohol and in dehydration of the alcohol, the relative adsorption coefficients of the reaction products vary with the temperature. Except for propylene, the reaction products are adsorbed more strongly than the feed components.

Of the reaction inhibitors tested, acetone and water are the strongest.

Kinetics of Hydrogenation of Carbon Monoxide Over a Nickel Catalyst

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A study of kinetics of hydrogenation of carbon monoxide over a nickel catalyst was carried out at atmospheric pressure. In the kinetic region, the reaction rate is defined by the equation for zero order reactions. The corresponding activation energy of the reaction is 16.2 kcal/mol and the coverage of the monomolecular layer of the active catalyst surface by carbon monoxide is 0.3.

The results show that the effect of the mass transfer processes on the reaction rates is a function of the CO concentration. For example, at the experimental conditions and the CO concentrations smaller than those specified, the hydrogenation process occurs at kinetically reversible conditions. The temperature-CO concentration correlations, which are given, define for the process the points of transition from the kinetically-controlling region to the internal diffusion-controlling region, and, finally, to the region where external diffusion controls. The assumption is made that the interaction of the chemisorbed hydrogen and CO is the limiting step of the process.

Oxidation of Hydrogen on Platinum Metal

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The mechanism of hydrogen oxidation on platinum was studied by measuring the kinetic isotopic effects and the reaction kinetics at static conditions and pressures of the order of 10^{-1} mm Hg. At a temperature of 20°, the reaction rate is proportional to the square root of the oxygen concentration and is not affected by the hydrogen concentration. These observations and the finding that the rates of individual H_2 and D_2 oxidation reactions are equal—demonstrate that the hydrogen does not participate in the over-all rate-determining step of the process. On the other hand, presence of the oxygen concentration term in the kinetic equation argues in favor of its participation in the rate-controlling step. The half-order of the reaction with respect to the oxygen is interpreted to be the result of the O_2 dissociation during adsorption on Pt.

Oxidation of Carbon Monoxide Over Titanium Dioxide and Over Its Solid Solutions With Tungsten and Iron Oxides

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Catalytic activity of titanium dioxide and of its solid solutions in oxidation of CO shows that the changes in the volumetric and electronic properties of these solids are paralleled by alterations in their catalytic properties.

With the aid of the kinetic data for oxidation of CO, of the earlier results of O_2 and CO chemisorption, and of the data on the electron work functions of these catalysts,—a multi-step CO oxidation mechanism is considered via the formation of an intermediate complex of CO_3 type.

Investigation of Adsorption Processes With Aid of Messbauer Effect

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Adsorption of $(CH_3)_4$ Sn by γ-Al_2O_3, silica gel, and other adsorbents was investigated with the aid of Messbauer effect. The results show that the surface of these adsorbents has active centers of at least two different types.

The kinetic principles governing the interaction of $(CH_3)_4$ Sn with the alumina surface were determined. The Messbauer spectra distinctly reflect changes in the adsorption temperatures as well as the donor-acceptor characteristics of the adsorption centers.

Adsorption Methods of Evaluation of Catalysts for Vinyl Acetate Synthesis in Vapor Phase

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The mechanisms of adsorption of acetylene and vaporized acetic acid were determined, using the