tivity and comparative para-ortho rates of hydrogen conversion indicate that the rate of acetone desorption is the limiting step of the process.

The study of the reaction kinetics was based on the concepts applicable to two-stage reactions over nonhomogeneous catalytic surfaces.

Mechanism and Kinetics of Catalytic Hydrogenation in Liquid Phase: Some of the Principles of Hydrogenation of Unsaturated Hydrocarbons Over a Skeletal Nickel Catalyst

By A. B. Fasman and D. V. Sokolskii

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Reaction kinetics of catalytic hydrogenation of hexene-1 and of *trans*-piperylene were studied to determine the effects of the following operating variables: intensity of mixing; nature of solvent; temperature; concentration of the unsaturated hydrocarbons and of the catalyst in the reaction mixture. At identical reaction temperatures and mixing intensities and different concentrations of the catalyst and olefin in the reaction zone, the maximum specific hydrogenation rate remains constant. The maximum catalytic activity occurs at surface coverages of 33 to 50% by the reacting hydrocarbon. The factors hindering hydrogen transport to the catalyst improve its selectivity.

Kinetics of Dehydrogenation of Cyclohexadiene-1,3 Over Platinum Films at a Wide Range of Reaction Temperatures

By V. D. Yagodovskii, V. M. Griaznov, and E. A. Savel'yeva

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In dehydrogenation of cyclohexadiene-1,3 over dense platinum films, the experimentally-determined value of activation energy sharply increases at reaction temperatures in the 200°–500° range. The activation energy shows a similar increase in value when thermal pretreatment of Pt films is followed by operation at 500°–600°. These results are possibly due to thermodynamic near-equilibrium state of the active portion of catalyst surface.

Conversion Reactions of Ethylene Over an Aluminosilicate Catalyst

By S. V. Markevitch

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The effects of reaction temperature and of thermal pretreatment of catalyst in vacuum and in oxygen atmosphere upon conversion of ethylene were determined using a commercial-grade aluminosilicate bead catalyst. The results show that rupture of the C—C and C—H bonds occurs at 350°–450°. The yields of ethane, propane, propylene, butanes, butylenes, and butadiene were calculated from the results of mass spectrographic analyses. A scheme of possible reaction routes is presented to explain formation of the end-products from the primary surface complexes.

Application of Law of Maximum to Determine Optimum Conditions for Exothermal Reactions

By Yu. M. Voleen, G. M. Ostrovskii, and M. G. Sleenko

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A method to select optimum operating temperatures by application of the "Law of Maximum" is described for the rate of reaction-limited chemical processes, using liquids with ideal displacement characteristics. An analysis of the generalized scheme is presented to obtain optimum temperatures. A relationship is shown between the "Principle of Maximum" and the variational and the dynamic programming methods of calculation.