not complete by either route, the rate by Route (1) is greater.

Empirical and theoretical equations are proposed to calculate the reaction rates. The theoretical equation is based on the reaction mechanism proposed by the authors. The results calculated by use of these equations are in close agreement.

Decomposition of Monomethylamine Over Metallic Molybdenum and Nickel Catalysts

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Interaction of monomethylamine (MMA) with molybdenum and nickel surfaces was studied at temperatures of 200°–1500° by a mass spectrometric method. The results show that MMA decomposition rates depend upon the rates of metal surface fouling with carbon formed in the reaction. With molybdenum, the extent of surface fouling—by carbide—depends on the extent of carbon diffusion into the metal; with nickel, the degree of fouling—by carbon—is, probably, a function of atomic carbon migration rates on the metal surface. In either case the products of MMA decomposition are N_2, H_2, C, NH_3, HCN, and CN. However, with Mo, the principal products are N_2, H_2, and C; but with Ni: HCN, H_2, NH_3, and C.

Catalytic Activity of Metal Oxides in Propylene Oxidation Reactions

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Specific rates of propylene oxidation over different metallic oxides were determined by a recycle—continuous method. The oxidation temperatures to attain constant specific oxidation rates with various fixed concentrations of the reactants were chosen as activity characterization factors. In descending order, catalytic activities of the metal oxides in partial and complete oxidation of propylene are, respectively: Cu > Co > Fe > Ni > V *and* Mn > Cu > C > Co > Fe > U > Cd > V > Ni > Mo > Zr > Pb > W. Depending on position of these metals in the Periodic Table the shapes of their activity curves in the subject, reaction resemble the shapes of the curves obtained in oxidation of hydrogen and in homomolecular and isotopic oxygen exchange reactions. The observed similarity of these curves is, apparently, due to oxygen participation in the formation of the activated complexes, the intermediate products in these processes.

Catalytic Dehydrogenation of 2,2-Dimethylbutane

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Dehydrogenation of 2,2-dimethylbutane over a potassium aluminochromate catalyst at atmospheric pressure and a temperature of 500° results in 8.5 mole % (on charge) yield of 3,3-dimethylbutene-1. Addition of helium as an inert diluent increases the yield of neohexene to 10–11 mole % (on charge).

Effect of Chemical Composition and Methods of Preparation of Complex Oxide Catalysts Upon Their Physico-Chemical and Catalytic Properties: Silica-Zirconia Catalysts

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A study was made of the effect of methods of preparation and thermal pretreatment upon activity of silica-zirconia catalysts. The results show that catalytic activity of the samples tested for dehydrogenation of isopropyl and ethyl alcohols is a direct function of the number of acid centers, but that the activity of the centers is not affected either by the SiO_2/ZrO_2 ratios, nor by the methods of preparation and thermal pretreatment of the samples. The following properties are affected by the catalyst preparation histories: pore structure, impurity content, extent of interaction among its components.

Effect of Chemical Composition and Methods of Preparation of Complex Oxide Catalysts Upon Their Physico-Chemical and Catalytic Properties: Alumino-silicate Catalysts

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The extent of interaction of aluminum oxide with silicic acid and the resulting number of acid centers in the catalyst samples vary with the composition and methods of their preparation. Of the catalysts with identical composition, those prepared by coprecipitation have the greatest number of surface acid centers. With increasing Al_2O_3