concentration in the alloy, decreases the power exponent, *m*, of the kinetic equation from 0.5 to 0.2.

Based on measurements of the reaction rates at equilibrium, catalytic activity per unit of surface of the alloys of widely different composition remains substantially constant despite changes in the crystal structure.

Catalytic Properties of Rare Earth Oxides in Conversion of *n*-Butane

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Catalytic properties of oxides of La, Ce, Pr, Nd, Sm, Ho, Er, Dy, Yb, Tm, and Tb were investigated at temperatures of 400°–550° in a recycle-continuous unit, using statistical method of treatment of the experimental data. Catalytic properties of erbium oxide were also determined for conversion of ethylene, ethane, and propylene.

In all cases, the reaction kinetics were expressed by the first order equation. The specific reaction rate, pre-exponential factor, and activation energy were determined for each catalyst. Lack of correlation was noted between activation energy and magnetic properties of the rare earth oxides.

Electronic Factor in Kinetics of Chemisorption on Semi-Conductors

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Kinetics of chemisorption on semi-conductor surfaces was investigated in the framework of the electronic theory, which takes cognizance of the electrically neutral and charged forms of chemisorption. Kinetics of each form are examined and the conditions to maintain electronic equilibrium on the surface of a semi-conductor are determined for the process. Activation energy of adsorption is calculated as a function of the parameters characterizing electronic state of a system considered. Characteristics of reversible and irreversible chemisorption processes are examined.

Kinetic Parameters of Dehydrogenation of Tetralin and Ethyl and Isopropyl Alcohols and of Dehydration of the Alcohols Over Erbium Oxide.

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The results are presented covering an investigation of kinetics of dehydrogenation of tetralin and of dehydrogenation *and* dehydration of ethyl and isopropyl alcohols—over an erbium oxide catalyst. The relative coefficients of adsorption of the products, true activation energies, and bond energies of the C, H and O atoms interacting with atoms of the catalyst were determined for each reaction. The thermodynamic functions: ΔF, ΔH, and ΔS, were calculated in adsorptive displacement of tetralin and isopropyl ether by the respective reaction products.

Hydrogenolysis of Ethane Over Nickel Catalysts in Continuous Flow Systems

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The results of hydrogenolysis of ethane over nickel catalysts at temperatures of 290°–310° show that pretreating a Ni/kieselguhr catalyst with nitrogen at 290°–310° to displace the surface hydrogen lowers activation energy to 19 kcal/mole. Al_2O_3 and Cr_2O_3 carriers decrease activity of nickel catalysts.

Effect of Anodic and Cathodic Polarization of Catalysts on Their Activity in Ammonia Synthesis

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In ammonia synthesis processes, cathodic polarization of catalysts increases initial yields of ammonia; on the other hand, anodic polarization decreases the yields. The more active a catalyst the smaller the initial effect due to cathodic polarization; the opposite is true of the anodic polarization. The catalysts are deactivated by extended cathodic polarization periods and activated by the anodic.

In ammonia synthesis over iron catalysts, promoting action of additives is attributed to acceleration of the onset of the acceptor stages in the electrochemical mechanism of the process. It