perimental data validates the original assumptions made.

A differential equation is proposed for the kinetics of the process and a general method of its solution is described. Techniques for solution of specific problems are also discussed.

Catalytic Effect of H-Ions of "Sulfocationites" On Dehydration of Chlorotetracycline In a Sorbed State

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An investigation was made of the reaction mechanism in dehydration of chlorotetracycline (CTC) adsorbed on various "sulfocationites," with the reaction occurring as a result of the catalytic effect of the unsubstituted H-ions of resin. For the resins investigated, the kinetics of dehydration of sorbed CTC from resins alone, as well as from their aqueous solutions, can be described by the equation for the first order reactions.

At equal volumetric concentrations of the H-ions, the dehydration rates over the "cationites" from various source-substances were found to differ in value by as much as twelve-fold. The activation energies of the dehydration reaction with a strongly swelling "cationite" and with an aqueous solution of CTC are equal; however, with weakly-swelling "cationites" the energy values are somewhat smaller.

The Mechanism of Aldiminic Hydrogenation of Dinitrile of Adipic Acid and the Effect of the Nickel Catalyst Carriers on the Course of the Process

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Show that in hydrogenation of adiponitrile over nickel catalysts, formation of secondary and tertiary amines is favored when using acidic carriers as well as the carriers able to activate atomic nitrogen in the substances containing it. The change in the course of the reaction in presence of the carriers of the above types is explained as due to the aldiminic mechanism for formation of secondary and tertiary amines.

On the same carriers, nickel-boron catalysts are appreciably more active than nickel catalyst alone.

Adsorption of Thiophene-n-Heptane Solutions on 5A Molecular Sieves

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At a temperature of 20°, contacting liquid solutions of thiophene—n-heptane over the entire range of equilibrium concentrations with 5A crystalline zeolite results in positive adsorption of n-heptane alone; at the same time, filling of the zeolite cavities by the n-heptane molecules 5A in diameter is completed at very low equilibrium concentrations (maximum N_2 of 0.01). At relative pressures in intermediate range, adsorption of vaporized n-heptane approaches the maximum value for adsorption of n-heptane from its liquid mixture with thiophene. From the adsorption measurement data for gaseous nitrogen, argon and krypton at a temperature of −195°, water vapor and vaporized n-heptane at 20°, and from the data of this study for n-heptane—thiophene solutions, the number of molecules in each large cavity of the 5A zeolite was evaluated for each of the aforesaid substances. Their quantity per cavity was found to depend greatly upon the configuration of adsorbed molecules.

Utilization of Frost's Equation to Calculate Kinetics of Heterogeneous Catalytic Reactions

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Evaluated was the effect of the constant absolute error, incurred in determining the extent of conversion,—upon the results for reaction kinetics as developed with the aid of Frost's equation.

In presence of such errors, the conversion plots, expressed in terms, $(F/W)\ln(1 - x_A)^{-1} - (F/W)x_A$ as the coordinates, are curved, rather than straight, and these in some cases pass through the origin of the coordinates.

For moderate conversion values, the curves may be replaced by straight lines without introducing a large error. The angular coefficient of the straight lines so produced may be greater than unity. The temperature function, corresponding to the erroneous values of α_A so obtained, nevertheless gives correct apparent activation energy values.

Presence of systematic errors, which were regarded in the past as contradictory to the physical meaning of the equation constants, may be helpful in interpreting experimental data.

Adiabatic Compression As a Method to Study Chemical Reactions Under Non-Stationary Conditions

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The possibility to apply adiabatic compression of gases in studying chemical reactions at non-isothermal conditions was investigated for temperature changes up to 10^7 degrees per second.

It was demonstrated that with the equipment used it is possible to achieve adiabatic compression and expansion of gases and, at the same time, to vary processing conditions.

Taking into account the effect due to the adiabatic conditions, the authors present equations to express functional correlations between time and pressure, temperature, and other parameters of compression processes.

Determination of Electron Work Function in Solids By a Vibrating Condenser Method

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A metallic cell was built and successfully employed to measure the contact potential differences (CPD) by a vibrating condenser method. The cell makes possible to carry out the studies at a pressure of 10^{-6} mm Hg. The metallic cell completely excludes the influence of a static field, which is impossible with the cell made of glass.

The CPD measurements of samples of nickelous oxide containing various amounts of lithium oxide were made in vacuum. For small additions of lithium oxide (0.25 to 0.82 atom %) to the nickelous oxide, the electron work function of the nickelous oxide increases with increasing concentration of the added oxide; on the other hand, for samples containing large amounts of lithium oxide (3 to 8 atom %), the electron work function approximates that of pure nickelous oxide.

Thus, for nickelous oxide the electron work function value changes with a change in the concentration of added lithium oxide, and passes through the maximum at a specified low concentration of the added oxide.