oxygen groups. However, in the case of Cr_2O_3, absorption of foreign molecules may produce structural changes and destruction of these groups.

Kinetics of Reactions Involving Participation of a Solid Phase: Carbiding Molten Iron Catalysts by Carbon Monoxide

By A. Ya. Rozovskii, M. M. Beeriukovitch, A. A. Ivanov, Yu. B. Kagan, and A. N. Bashkeerov

The Institute for Petrochemical Synthesis of the Academy of Sciences of U.S.S.R.

Propose a method to calculate kinetics of the extra-kinetic-region reactions which involve participation of a solid phase. Using this method, present calculated values of specific reaction rates and activation energies in CO-carbiding of promoted and unpromoted molten iron catalysts (used in the $CO—H_2$ synthesis). Also give calculated activation energy values for the diffusion-controlled region of this reaction.

The calculated data indicate that interstitial migration of carbon is the limiting step in the reaction.

Chemiluminescence in Slow Chemical Reactions: Effect of Chemical Composition of a Reaction System on Intensity of Chemiluminescence

By R. F. Vaseeliev, A. A. Veechooteenskii, O. N. Karpookheen, and V. Ya. Shliapeentokh

The Institute of Chemical Physics of the Academy of Sciences of U.S.S.R.

A kinetic mechanism is proposed to explain the effect of composition of radicals upon intensity of chemiluminescence. Subsequent verification of the proposed mechanism substantiates accuracy of the correlations based on experimental data.

Possible utilization of the chemiluminescence measurements is considered to evaluate the relative and absolute rate constants of the reactions between radicals and molecules.

Homomolecular Exchange of Oxygen Over Oxides of Metals of the Fourth Period: Catalytic Activity and Bond Energy of the Oxide Oxygen

By G. K. Borieskov, A. P. Dzeesiak, and L. A. Kasatkeena

The Institute of Catalysis of the Siberian Division of the Academy of Sciences of U.S.S.R., D. I. Mendeleyev Chemico-Technological Institute in Moscow

In terms of isotopic exchange with molecular oxygen, catalytic activity is, in the main, defined by the bond energy of the oxygen in the surface layer of the oxides. No simple correlation has been found between the electron work function and catalytic activity.

Catalytic activity of these oxides is correlatable with respect to the isotopic exchange and hydrogen oxidation reactions. Thus, the homomolecular oxygen exchange rates can conveniently serve as the indices of reactivity of the oxide oxygen in the surface layer.

Effect of Covalent Bonding Upon Kinetics of Hydrogenation of Polycyclic Hydrocarbons

By I. V. Kaletcheetz, A. S. Nakhmanovitch, and V. M. Kazantzeva

The Institute for Petro- and Coal-Chemical Synthesis of the Siberian Division of the Academy of Sciences of U.S.S.R.

The reaction rate constants were determined in hydrogenation of aromatic hydrocarbons (benzene, diphenyl, tetracene, anthracene, naphthalene, phenanthrene, benzophenanthrene, coronene) over a platinum catalyst. The results show that the rate of hydrogen addition to the hydrocarbons of the SAME type—linear, angular, or centered—depends upon the number and type (single, double, or triple) of the covalent bonds. These results are explainable in terms of peculiarities of geometric orientation of the bonds at the catalyst surface. The rate of hydrogenation also depends upon the nature of solvent used, since it is affected to a varying degree by the products formed. In addition, the rate is a function of the ratio of an adsorbed substance to the hydrogen.

Kinetic Data as a Basis for a Mechanism of Hydrogen Redistribution in Cyclohexene and Cyclohexadiene—1,3 Over a Palladium Catalyst

By V. M. Griaznov and V. D. Yagodovskii

M. V. Lomonosov State University in Mocsow, Chemistry Department

Present evidence to support the concept that redistribution of hydrogen in cyclohexene and in cyclohexadiene results from the combination of distinct stages in dehydrogenation and hydrogenation of hydrocarbon feeds.

Demonstrate that the concept of direct hydrogen transfer among the three cyclohexene molecules is not supported by the experimental data

Poisoning of Nickel Catalysts by Carbon Bisulfide

By G. D. Liubarskii and L. B. Avdeyeva

L. V. Karpov Physico-Chemical Institute

Absorption of carbon bisulfide by nickel catalysts was studied by abstracting it from benzene solutions and in vapor phase hydrogenation o