

a luminophor (e.g., *n*-terphenyl or 2,5-diphenyl azazole) were studied. The protective action of luminophors against the radiation-sensitized decomposition of the peroxide and extinguishing by the peroxide of the photo- and radio-luminescence of luminophors can be explained by hypothesizing the existence of a competing transfer of energy from the solvent to the two acceptors and from a luminophor to the peroxide. The energy transfer from toluene to benzoyl peroxide and to luminophors occurs by a "remote-action" mechanism although displacement of the interacting molecules by diffusion also exerts substantial effect. The transfer of energy from a luminophor to the peroxide apparently occurs by a diffusion mechanism, via the formation of an intermediate complex from the peroxide and the excited molecules of a luminophor.

#### Reduction of Uranium Trioxide by Mixtures of Nitrogen and Hydrogen

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Kinetics of reduction of uranium trioxide by hydrogen-nitrogen mixtures was investigated at temperatures of 350°–500° and pressures of 25–600 mm. Hg. Apparent activation energy of this reaction was found to be 26.5–31.7 kcal/mole. Show comparative characteristic data for reduction of uranium trioxide by pure hydrogen and ammonia.

#### Comparative Kinetic Properties of Kationites KU-1, SDV-3, SM-12 and SBS

By G. M. PANCHENKOV, V. I. GORSHKOV,  
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The kinetics of ion exchange was studied by contacting 0.01–1.0 *N* NaCl solutions at temperatures of 6°–35° with thin layers of H-type cationites: SDV-3, SM-12, KU-1, and SBS.

#### Catalysis of Solid Phase Reactions: Thermal Decomposition of Ammonium Perchlorate in Presence of Ferric Oxide

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Catalytic action of ferric oxide upon ammonium perchlorate at various stages of decom-

position was investigated at identical operating conditions. At 210°–240° ferric oxide exerts only minor effect upon the reaction rate, but at 245–270°, and at elevated temperatures, its catalytic action is significant. Consideration of the kinetic data leads to the conclusion that ferric oxide accelerates the anion-to-cation electron transfer, the reaction controlling step.

#### Kinetics of Solid Phase Reactions: II. Hydrogenation of Iron Carbides

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A study of the kinetics of hydrogenation of the iron carbide formed in an iron catalyst for synthesis of CO and H<sub>2</sub> shows that the kinetic concepts developed earlier also apply to this reaction. The specific reaction rates and activation energies were determined using pertinent calculation methods employed in the earlier study. The value of the activation energy so obtained agrees with that determined independently from a reaction rate-temperature correlation at various fixed conversion values.

#### Correlation of Catalytic Activity of Semiconductors with the Constants Characterizing Their Photoconductivity and Photoconductivity Kinetics

By V. A. JOORAVLIOV AND V. N. KOOLEETZKII

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The constants characterizing photoconductivity and kinetics of photoconductivity of semiconductors are correlated with their catalytic activity. This correlation study shows that only the photoconductivity relaxation periods are correlatable with the activity values. Existence of this correlation follows from the electronic theory of catalysis and the assumption that catalytic reactions are preceded by desorption of the adsorbed particles.

#### Reactions of $\alpha$ -Oxides: II. Kinetics of Reaction of Ethylene Oxide with Acetic and Monochloroacetic Acids

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Kinetics of reaction of ethylene oxide with acetic and monochloroacetic acids was studied