than the energies of the same reactions in liquid phase. This difference is ascribed to specificity of the solid phase reactions, where mobility of the particles is greatly inhibited.

Radio-Chemical Decomposition of $KClO_4$

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EPR studies were made of the nature of the paramagnetic centers which are produced in potassium perchlorate by exposure to ionizing radiation at a temperature of 77–450°K. The kinetics of accumulation and recombination of the paramagnetic centers at these temperatures were also investigated. The results show that recombination of ClO_2 and O_3^- radicals is a reaction of second order.

Isotopic Oxygen Exchange Over Neodymium Oxide with Different Crystal Structures

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The study of isotopic oxygen exchange was made at temperatures of 300°–500° over neodymium oxides with cubic, hexagonal, and cubic-hexagonal crystal structures. The study also covered the exchange of isotopic oxygen with the oxygen of the hexagonal-form oxide.

Activity of the oxides in isotopic oxygen exchange was found to depend on the history of their pretreatment in vacuum and in oxygen atmosphere. The crystal structure of the oxides shows no effect on their activity.

Activation energy of the isotopic oxygen exchange reaction is 30 kcal/mol and that of the exchange of isotopic oxygen with the oxide oxygen is 20 kcal/mol.

Nature of Surface Defects of Irradiated Silica Gel: Catalytic Properties of Irradiated Silica Gel in Isotopic Hydrogen-Deuterium Exchange

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Catalytic activity of irradiated silica gel was evaluated in an isotopic hydrogen-deuterium exchange reaction. The apparent energy of activation and order of the reaction were determined on the mixture partition basis. The results show that activity of the samples studied is greatly affected by the admixed aluminum concentration and by the activation and irradiation conditions. A faster method of activation was developed by tempering the samples in hydrogen atmosphere as compared to the activation by tempering in vacuum. A relationship exists between changes in the catalytic activity and the corresponding changes in the adsorption capacity for hydrogen; a relationship also exists between changes in the intensity of the sextet signals of the EPR spectra and the corresponding changes in (a) the aluminum content of the samples, (b) the conditions of activation and irradiation, and (c) the conditions of calcination in vacuum and in hydrogen media. It is concluded that in the irradiated silica gel, the "tinted" surface centers, due to the admixed aluminum, are the active centers catalyzing isotopic exchange of molecular hydrogen and adsorption of hydrogen.

Catalytic Properties of Chelated Polymers with bis-Thioamides of Quinaldene as the Carriers

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Catalytic properties of chelated polymers were investigated, using bis-thioamides of quinaldine and salts of the transition metals as the carriers. The effect of the metals and of the chain radicals on catalytic properties of the polymers was evaluated in oxidation of cumene. The results show that catalytic properties of the polymers and the reaction course are defined by the changes in electronic density on the sequestered metal and on the ligand.

Electronic Spacial and Surface Properties of Zinc Oxide

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The electronic work function, electroconductivity, and oxygen adsorption capacity of pure and modified zinc oxide were determined, using samples calcined at temperatures of 500°, 900°, and 1,300°. The results show that the electrophysical and adsorptive properties of the semiconductor are significantly affected by the preparation history. Depending on the pretreatment history, electroconductivity of the samples is either in direct or in inverse relationship with the electronic work function. A relationship was also established between the oxygen adsorption capac-