fusion of butane through the pores was also determined.

Notes

Experimental Study of Dissociation of Excited Ions

G. V. Karachevtsev and V. L. Tal'rose

Institute of Chemical Physics, Academy of Sciences, USSR

The authors ionized ethylene, ethane, *n*-hexane, and toluene by bombardment with 2 KeV electrons and measured the rates of decay of the resulting ions. Most of the excited ions decay in less than 10^{-9}–10^{-10} sec; however, several complex ions decay at lower rates. The authors conclude that the usual mass spectra are not always suitable for determining the mechanism of a complex radiation-chemical reaction.

Mechanism of Action of Elemento-Organic Antidetonating Substances

D. S. Stasinevich

It is suggested that the antidetonating properties of organic compounds of Pb, Tl, Co, Mn, Fe, Ni, Cu, Bi, Te, and Se are governed by the heat of formation of their oxides (Q). If Q is less than some critical value, then the unbranched $RO_2^{\cdot}$-annihilating oxidation: $R\cdot + O_2 \rightarrow RO_2^{\cdot}$; $RO_2^{\cdot} + M \rightarrow RO\cdot + MO$; $MO + R\cdot \rightarrow M + RO\cdot$ (where M is a metal or its lowest oxide) is energetically more favorable than the branched (degenerate) oxidation going via $RO_2^{\cdot}$. The elements whose organic compounds have antidetonating properties all have values of $Q \leqslant 69$ kcal/mole.

Radical Formation in Low-Temperature Radiolysis of Benzoyl Peroxide

I. I. Chkheidze, V. I. Trofimov, and A. T. Koritskiy

Institute of Chemical Physics, Academy of Sciences, USSR

The low-temperature radiolysis of benzoyl peroxide was investigated by ESR and mass spectra. The primary gaseous radiolysis product is CO_2 (yield = 6.4 liters/100 eV). The hydrogen yield is 0.15 liter/100 eV. The main primary free radical is the phenyl. It undergoes a secondary reaction, adding to the benzoyl peroxide in a position *para* to the substituent. Radiolysis of one benzoyl peroxide molecule gives two radicals (because of liberation of CO_2). Free radical formation in azobenzene proceeds via the same path (because N_2 is liberated in this reaction).

Inhibition of Thermal Decomposition of Ammonium Perchlorate by the Products

B. S. Svetlov and V. A. Koroban

The Mendeleyev Chemical Engineering Institute, Moscow

The authors studied the decomposition of ammonium perchlorate at 130°–190°C without removing the gaseous products, and measured the resulting pressures. Under these conditions, the decomposition does not go to completion. It stops after a definite gas quantity has been liberated, corresponding to a definite pressure for each temperature (for example, 1600 mm Hg at 150°C). In addition to the usual substances obtained upon decomposition of ammonium perchlorate, the products contain substantial amounts of perchloric acid hydrates. The results are interpreted by assuming that NH_4ClO_4 decomposes via a complex process which includes a reversible dissociation and a self-catalyzing decomposition of the starting salt, in which the products of decomposition of $HClO_4$ participate. The overall process is inhibited by the accumulation of stable hydrates of perchloric acid.

Chemisorption of H_2 and O_2 on Zinc and Aluminum Oxides in the Presence of Gamma Radiation

A. A. Gezalov and G. M. Zhabrova

Institute of Chemical Physics, Academy of Sciences, USSR

The authors have studied the chemisorption of H_2 and O_2 on ZnO or α-Al_2O_3 with approximately the same specific surfaces (13–14 m^2/gm) in the presence of γ-irradiation. The temperature was 20°C. Given the same initial pressures, the rate of chemisorption of oxygen is higher; the oxygen-surface bond is also stronger. The results are interpreted in the light of possible chemical reactions of the chemisorbed gases with the oxides, as well as in the light of possible electronic structures.

Oxidation of Propylene over Silver. I. Unpromoted Catalyst

L. M. Kaliberdo, A. S. Vaabel', G. G. Zhukova, P. R. Kubakina, and N. I. Popova

Institute of Petro- and Coal Chemistry, Irkutsk State University

The authors have studied the oxidation of a propylene-propane mixture over an unpromoted silver catalyst. In addition to propylene oxide, the products contain propionaldehyde, acetaldehyde, acetone, and methanol. The catalyst properties depend on the method of preparation.

Effect of Prior Reduction (with Hydrogen) of a Chromia-Alumina-Potassium Catalyst on Its Later Activity in Dehydrogenation of Butane to Butylenes

YU. S. KHODAKOV, O. D. STERLINGOV, AND KH. M. MINACHEV

The Zelinsky Institute of Organic Chemistry, Academy of Sciences, USSR

The authors have studied the effect of the temperature and duration of the reduction of the above catalyst with hydrogen on its later activity in fluidized bed catalysis. Up to 600° and 6 hours, an increase of the above factors increases the subsequent activity. The authors have discovered a deactivation of a freshly activated catalyst upon its contact with dry air.

Low-Pressure Catalytic Dehydrogenation of Isopentane

O. D. STERLINGOV AND T. G. OL'FERIEVA

The Zelinsky Institute of Organic Chemistry, Academy of Sciences, USSR

The authors have studied the time variation of activity of an unreduced chromia-alumina-potassium catalyst during dehydrogenation of isopentane at low pressures. Under these conditions, the catalyst is activated by the dehydrogenation and rearrangement reactions. At atmospheric pressure, the yield of dehydrogenation products is much higher than that of rearrangement products.

Kinetics of the High-Temperature Reactions of H_2S and COS with Bauxite

O. P. KOROBEYNICHEV

Institute of Chemical Kinetics and Combustion, Siberian Department, Academy of Sciences, USSR

The author has studied all aspects (including the calorimetry) of the kinetics of those reactions of H_2S and COS with bauxite which take place during removal of sulfur compounds from flue gases, and has described the mechanism by a system of interlocking consecutive reactions. This mechanism requires the assumption that the reaction of COS with H_2O, catalyzed by the bauxite surface, accelerates the reaction of H_2S with iron oxide. This interlocking of reactions requires the presence of intermediate activated molecules.

Ultraviolet Spectra of Diphenylamine Adsorbed on X and Y Zeolites

A. V. KISELEV, L. A. KUPCHA, AND V. I. LYGIN

Chemistry Department, The Lomonosov State University, Moscow

The spectrum of diphenylamine adsorbed on cationic zeolites exhibits only the bands of the physically adsorbed molecules. In the event of adsorption on de-cationized zeolites, the spectrum also exhibits bands due to oxidation products and ions produced by donation of electrons from the diphenylamine to the aprotonic sites of the zeolite.