Thermogravimetric Investigation of Mechanism and Kinetics of Decomposition of 50/50 Mol % Mixture of Ca and Li Acetates

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A thermogravimetric study of thermal decomposition of a 50/50 mol per cent mixture of acetates of Ca and Li was carried out at temperatures of 341°–388°. The results show that the mixture decomposes at a faster rate than its pure components. A 50/50 mixture of acetate of one metal and of carbonate of the other metal decomposes somewhat faster than the mixture of the two metal acetates. The decomposition rate curve of the 50/50 mixture of the two metal acetates has two maximum points. The value of the temperature coefficient for thermal decomposition of this mixture equals that for catalytic decomposition of $HC_2H_3O_2$ over a $CaCO_3$–Li_2CO_3 catalyst.

"Step-wise" Recombination of Free Radicals in Irradiated Organic Compounds: Experimental Studies of the Recombination Kinetics

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A study of kinetics of "step-wise" recombination of free radicals in a solid phase was carried out, using a number of organic compounds to illustrate the reaction mechanism. The results show that kinetic stoppage of the recombination process is a phenomenon which is common to substances with widely different structures. In all cases the concentration of "stable" radicals usually decreases lineally with a temperature rise. With phenol, the rate to reach a "quasi-stationary" concentration markedly increases upon increasing the rate of heating-up the sample to a desired temperature.

Electroconductivity of Aluminosilicate Cracking Catalysts

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A study was made of the effect of temperature on the electroconductivity of aluminosilicates of different composition and of pure alumina. The results show that electroconductivity of aluminosilicates varies greatly with the composition and that the catalysts with 30% Al_2O_3 —70% SiO_2 content have greatest conductivity.

An investigation of the effect of added alkali metal ions shows that the electroconductivity increases sharply with the added ion concentration.

A discussion is presented covering the nature of electroconductivity in aluminosilicate catalysts and the relationship between electroconductivity and catalytic activity.

Effect of Different Ionizing Radiations on Catalytic Dehydration of *n*-Decyl Alcohol and on Isomerization of α-Decene

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An investigation of the effect of different types of ionizing radiations on the rates of dehydration of *n*-decyl alcohol and isomerization of α-decene shows that X-ray pre-irradiation of Al_2O_3 increases conversion of the alcohol. Continuous X-ray irradiation of the reaction system is particularly effective.

Pre-irradiation of alumina in a nuclear reactor using slow neutrons and γ-rays of CO^{60}, decreases the alcohol dehydration rate. Irradiative pretreatment of alumina by fast neutrons has no effect on the rate of conversion of the alcohol over the irradiated catalyst.

Effects of Surface Coverage and Dehydration on Changes in Infra-Red Spectrum of Benzene Adsorbed on Aerosil

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Changes in the spectra of benzene and hydroxyl groups adsorbed on aerosil were investigated. Displacement of the adsorption band of the free hydroxyl groups of aerosil depends on the surface coverage. In adsorption of benzene, the adsorption band of extra-planar deformational oscillation of a CH group in benzene sustains the greatest change.

At low hydroxyl group coverages of aerosil surface, the state of the C_6H_6 molecules differs drastically from their liquid and gaseous states. At high surface coverages the state of the C_6H_6