

of the contacts themselves. The hydrothermal activation treatment substantially increases the strength of the interglobular contacts. The increase in strength accompanying the calcining is largely due to strengthening of individual contacts.

Control of Reaction Temperature by Introduction of a Cold Stream as a Means of Producing Optimal Condition for an Exothermic Reaction

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The problem of optimal temperature for a catalytic process in which the cold stream is introduced at a uniform rate was solved by the Pontryagin maximum principle. This gave the conditions necessary for the optimality of the temperature, as well as the boundary conditions for the quantity and feed rate of the cold stream and the maximum process temperature. The results are applied to the case of the reversible exothermic oxidation of SO_2 with continuous feed of cold air, where the theoretically-optimum conditions were determined.

NOTES

The Calculations of the Orienting Effect of Substituents in the Addition of Atomic Hydrogen to Substituted Benzenes (MO-LCAO approximation)

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The simple MO-LCAO approximation was used to evaluate the orienting effect of substituents on the addition of atomic hydrogen to various substituted benzenes; the effect of superconjugation of the CH_2 group with the π -system of the ring is discussed.

The Role of Additives in Radiolysis

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The author formulates the quantum-mechanical condition under which it is possible to localize excitation in molecules of the main substance near the impurity particles. It is shown that most

of the radiolysis of the main substance will take place near the impurities.

Kinetics of Decomposition of Copper Benzoates

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The authors have studied the kinetics of the thermal decomposition of copper benzoates, toluates, as well as *o*- and *p*- chlorobenzoates. This is a first-order reaction;

$$k_{\text{toluate}} > k_{\text{benzoate}}; k_{p\text{-toluate}} < k_{m\text{-toluate}}; \\ < k_{o\text{-toluate}}; k_{o\text{-chlorobenzoate}} \gg k_{p\text{-chlorobenzoate}}$$

Magnesium oxide promotes the rate of decomposition of copper *o*-toluate to cresol and the starting acid.

Catalysis of Ammonium Nitrate Radiolysis by Semiconducting Oxides

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The authors have studied the effect of mechanical admixtures of ThO_2 , ZnO , $\text{NiO} + \text{ZnO}$, doped Li_2O and Al_2O_3 on the X-ray induced radiolysis of NH_4NO_3 *in vacuo*. It was shown that the activity of these oxides correlates with their $\Delta\phi$ (where ϕ = electron work function), and that oxides with the lowest ϕ are the best catalysts. As far as oxide concentration is concerned, the greatest effect was obtained at a relatively low concentration.

Participation of Channel Black in the Chain Termination in Polyethylene Oxidation

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The authors have studied the oxidation of high-pressure polyethylene in the presence of the antioxidant 2, 4, 6 tri-*tert*-butylphenol, as well as an antioxidant of moderate activity (phenyl- β -naphthylamine), and channel black. Channel black decreases the rate of oxidation in all cases where the RO_2^* concentration is high (whether in the absence of the antioxidant, or whether in the presence of the weak antioxidant, or subcritical concentrations of the moderate-activity compound). This phenomenon is probably due