

line solid being decomposed. The effect of different factors, including that of heterophase additives, on thermal decomposition of solids is considered from the above point of view. The results by the authors and by other investigators are discussed in the light of the concepts presented.

Effect of Ionizing Radiation and of Other Factors on Rate of Topochemical Decomposition of Various Inorganic Compounds

V. A. GORDEY'YEVA, G. M. JABROVA,
B. M. KADENATZEE, AND
V. E. MEEKHLEEN

*Institute of Chemical Physics of the
Academy of Sciences of USSR*

Ionizing radiation and composition of a gaseous reactant affect differently the decomposition rates of hydroxides of magnesium and aluminum as compared to the effect of these factors on the rates of decomposition of oxalates of copper and nickel. Decomposition of magnesium and aluminum hydroxides is characterized by the presence of apparent induction periods and by the oxidation-reduction insensitivity of the gaseous media. Preirradiation of the hydroxides with γ - and β -rays has practically no effect on the subsequent course of their thermal decomposition. The decomposition of oxalates of copper and nickel is also characterized by noticeable induction periods and, in addition, by sensitivity to the oxidation-reduction properties of the gaseous media. Preirradiation of the oxalates shortens the induction periods and markedly increases the subsequent thermal decomposition rates.

Electronic (donor-acceptor) properties of the copper and nickel oxalates in the decomposition reactions are hypothesized on the basis of the experimental data of this study.

Activity and Electronic Properties of Complex Catalysts Used in Oxidation of Hydrocarbons

L. A. MARGOLEES, A. V. KRILOVA,
AND E. S. ALEXANDROVA

*Institute of Chemical Physics of the
Academy of Sciences of USSR*

Electroconductivities and electron work functions of certain mixed vanadia-molybdena catalysts were determined. Electro-physical and structural properties of these catalysts are listed alongside their selectivity characteristics in hydrocarbon oxidation reactions. The optimum component concentrations of the mixed catalysts are functions of the composition and preparation history of each system. Thus, selectivity of the mixed catalysts can be controlled by changing

electronic properties of the surface via incorporation of additives with different electronegativity properties. Selectivity of the catalytic systems produced by chemical combination of the two oxides depends upon relative distribution of the metallic and oxygen ions on the catalytic surface. Finally, with the multiphase-type systems, each of the above two factors bears importantly on the catalytic selectivity.

Effect of Reactant Mixtures on Catalytic Properties of Copper Catalysts in Oxidation of Propylene

YA. B. GOROKHOVATZKY, I. I. VOV'YANKO,
AND M. YA. ROOBANEK

*L. V. Peesarjevsky Institute of Physical
Chemistry of the Academy of Sciences
of Ukrainian SSR*

Catalytic properties of metallic copper and of copper oxides were determined by studying the mechanism of formation of catalytically active surfaces in oxidation of propylene and acrolein. The results show that with the copper oxides, a catalytically active surface is formed by the process involving transition of CuO to Cu_2O . As a result, productivity of the catalyst increases with respect to acrolein and decreases with respect to carbon dioxide. Stabilization of catalytic activity of the copper oxide catalyst occurs faster than equilibration of its chemical composition. Selectivity of the catalyst with respect to carbonyl compounds decreases with increasing oxygen content, i.e. with increasing degree of copper oxidation.

Investigation of Nature of Irreversible Chemisorption on Semiconductors

O. P'YESHOV

*Chemistry Department of M. V. Lomonosov
State University in the City of Moscow*

Interaction of chemisorbates with the additives dispersed in semi-conductive adsorbents is being investigated to determine effects of the additives on kinetics and partial irreversibility of the chemisorption reactions.

Relationship between Catalytic Properties and Electronic Structure of Iron-Cobalt Catalysts

R. F. LAVR'YENTOVEECH, M. T. ROOSOV,
YU. N. ART'YUKH, AND
D. A. L'YEVEENA

*L. V. Peesarjevsky Institute of Physical
Chemistry of the Academy of Sciences
of Ukrainian SSR*

A relationship was established between electronic structure of iron-cobalt alloys and their