tarded by the additives in the following order: $Cd^{++} < Hg^{++} < Pb^{++}$.

Compared to Cd^{++}, Pb^{++} increases the loss of dielectric properties of silver oxalate to a lesser degree and alters its ionic conductivity to a greater degree. The most probable reason for the quantitatively different effects of these additives is their increasingly stronger ionic bonding ($Cd^{++} \rightarrow Hg^{++} \rightarrow Pb^{++}$) with the charge-compensating cationic vacancies.

Principles of Formation of High Melting Point Compounds of Desired Catalytic Properties

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Catalytic properties of the transition series metals and of their alloys and reaction products with non-metals (boron, carbon, nitrogen, and silicon) were examined from the standpoint of relative degree of fill up of the atomic d-electron shells of these metals and the fillage of the d-shells on forming alloys and compounds by combination with the electron-donating non-metallic elements.

The discussion also points out the role of different types of atomic chemical bonds due to combination of alloys and compounds with the non-metallic elements, and the role of isolated structural complexes which are formed by the nonmetallic atoms within crystalline lattices. The factors responsible for low catalytic activity of non-metallic compounds are cited.

Effect of Adsorbed Oxygen on Changes in Zinc Oxide Conductivity with Temperature

By Yu. P. Soloneetzeen

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The results of simultaneous measurements of conductivity of zinc oxide and of oxygen gas pressure in a system at constant volume and at 20°–200° show that the anomalous decrease in conductivity of the oxide is accompanied by partial desorption of the oxygen. This phenomenon may be due to transition of the chemisorbed oxygen to a more highly charged state and to a simultaneous shift of the adsorption equilibrium toward desorption. The abnormally weak effect on the conductivity due to the oxygen adsorbed at temperatures of over 200°C is attributed to a gradual consumption of the system oxygen in oxidizing organic impurities.

EPR Studies of Structure of Active Centers of Chromium Oxide Catalysts for Polymerization of Ethylene

By V. A. Aleksandrov, V. B. Kazansky,
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A structural model is proposed for active centers in chromium oxide on silica gel catalysts for use in extensive polymerization of ethylene. The active centers are the Cr^{+5} ions stabilized on the carrier surface. It is suggested that the Cr^{+5} ions partially displace the Si atoms of the silica oxide tetrahedra in the surface layer of silica gel. As a result, the tetrahedra are deformed, causing anisotropy of *g*-factor of the EPR signals. The parameters of the signals, which were calculated on the basis of the model proposed, are in good agreement with the experimental results. The model also serves to explain the changes in the EPR signals due to poisoning of the catalysts by alkalies.

Electron Work Functions of Titanium Dioxide and of Its Solid Solutions in Chemisorption and Catalysis

By I. S. Sazonova, N. P. Keiyer

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The work functions of TiO_2 and of its solid solutions in WO_3 and Fe_2O_3 were determined in vacuum. Changes in the work function values were determined in chemisorbing gases of the electron-donor and electron-acceptor types, in oxidizing carbon monoxide, and in decomposing isopropyl alcohol. Based on the experimental results, feasible mechanisms are considered for the chemisorption and catalysis reactions over the catalysts studied.

Reactions of α-Oxides: Acid- and Auto-Catalyses in Reactions of Ethylene Oxide with Amines

By N. N. L'yeb'yed'yev, M. M. Smeernova

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This study of reaction kinetics of ethylene oxide with aniline and cyclohexylamine solvents demonstrates that these reactions are autocatalyzed by the aminoalcohol and that they are accelerated by water and alcohols in proportion to their relative acidity.

Diverse catalytic effects of many acids, such as phenol and perchloric acid, are shown to be func-