cyclization than analogous compounds obtained by reduction with hydrogen at 330°C. KOH affects both catalysts in an identical manner. Thus, small additions of KOH promote the activity, but large ones poison the catalyst. The ring expansion in 1,1,3-trimethylcyclopentane is gradually inhibited by higher base concentrations. The activation energies for dehydrocyclization on catalysts containing different amounts of KOH differ substantially. It would appear that small amounts of KOH promote the active sites on platinum. It is shown that the surface of platinized carbon contains several different types of active sites and that dehydrocyclization proceeds differently on every one of these.

The Activities of Phthalocyanins of Platinum Group Metals

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Osmium and ruthenium phthalocyanins (Pc) exhibit very high oxidizing activity, but the other phthalocyanins of this group are inactive. The activity of $(HSO_4)_2OsPc$ is higher than that of $(HSO_4)_2RuPc$; either of these is much more active than iron phthalocyanin. The authors have investigated the catalyst-poisoning effects of N_2F, HCN, and NH_3, and have determined the kinetics of homogeneous and heterogeneous reactions involving these catalysts, as well as the kinetic equation, rate constants, and activation energies. They postulate a mechanism for catalysis by phthalocyanins.

Oxygen-Initiated Heterogeneous Catalytic Polymerization of Olefins in the Presence of Hydrogen

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The authors investigated the behavior of 1-hexene-hydrogen mixtures (1.3–1.5:1) over clay-supported Co at 100°C and atmospheric pressure. Under these conditions, 1-hexene undergoes hydropolymerization to higher hydrocarbons. The yield is 7.5%. Addition of 1.3% O_2 increases the yield to 22%, while adding the oxygen and raising the temperature to 140°C raises it to 25%. It appears that no catalyst break-in period is necessary. At 190°C the oxygen ceases to promote the reaction.

Nonstoichiometric Sulfur in WS_2 Catalysts

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Nonstoichiometric amounts of sulfur are incorporated into the WS_2 catalyst during its preparation. This sulfur appears to account for the isomerizing and cracking activity of this catalyst. It is suggested that the sulfur is incorporated into the WS_2 lattice during formation.

Kinetics of Dehydrogenation of Cyclohexane over Chromium Oxide in a Nongradient System. II.

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The authors have studied the kinetics of dehydrogenation of cyclohexane over various chromium oxide catalysts in a circulatory-flow unit. The reaction rate may be described by $\omega = kP_{C_6H_{12}}$. The activation energies vary between 31 and 42 kcal/mole, depending on the catalyst. Comparison of the rates with the rate of the *para-ortho* conversion in hydrogen showed that under these conditions hydrogen desorption cannot be the controlling stage.

Gas-Chromatographic Studies on the Kinetics of Cumene Cracking over Modified Silica-Alumina Catalysts

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Pulse gas chromatography was used to determine the activity of a series of silica-alumina catalysts in cracking of cumene. The activities of amorphous silica-alumina catalysts are compared with those of Y-type zeolites of the same cationic forms.

Hydrogenation of Glucose on Raney Nickel. I.

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The authors studied the hydrogenation of glucose over Raney-type nickel-palladium and nickel-ruthenium catalysts at above-atmospheric pressure and with intensive mixing of the medium. Palladium or ruthenium are promoters of Raney nickel and can raise its activity by as much as 30% (0.1–0.5% ruthenium or 5% palladium). The controlling step is hydrogen activation (E_{act} = 12–

14 kcal/mole). However, addition of palladium or ruthenium does not yield more stable catalysts.

The Activity of Copper Polychelates and Their Monomer Analogs in Reactions with Hydrazine

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The authors have studied the decomposition of hydrazine in the presence of copper polychelates derived from α-thiopicoline anilides. Infrared and ESR spectrometry indicate that the hydrazine decomposition is accompanied by the decomposition of the chelate complex and reduction of the copper to metal. The initial reaction of the hydrazine with the copper complex is governed by the magnitude of the effective change on the cation (this change is a function of the nature of the ligand section not immediately adjacent to the copper). The catalytic activity of the complex decreases with the increase of the negative effective charge on the chelate-held copper. The first stage of the reaction is noncatalytic; subsequent stages are catalytic, and the active site is the copper atom.

The rate of decomposition of the polymers in the reaction with hydrazine exceeds that of monomeric complexes, and its magnitude is dependent on the degree of order in the polymer.

Infrared Spectroscopic Study of Reactions of Hydrazine with Copper Complexes Derived from Thiopicoline Anilides

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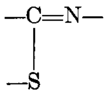
The authors have obtained the infrared spectra and have assigned the specific absorption bands of several thiopicoline anilides, as well as of products from reactions of hydrazine or deuterohydrazine (in gas phase) with copper chelate complexes derived from these anilides. It is shown that these reactions result in the decomposition of the chelate bond and, in most cases, the addition of one of the hydrazine hydrogens to the nitrogen of the chelate group



$$\begin{array}{l}-\text{C}{=}\text{N}-\\ \;\;|\\ -\text{S}\end{array}$$

Changes of intensity of infrared absorption lines were used to calculate the relative rates of decomposition of the complexes as a function of the substituents on the organic moiety.

The Mechanism of CO Oxidation over Lanthanum Oxide

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The mechanism of CO oxidation over lanthanum oxide at 300°–420°C was studied with the help of ^{14}C. Below 300°C, the activation energy $E_1 = 3$ kcal/mole, and the product CO_2 is completely adsorbed on the oxide surface. Between 300° and 400°C, the controlling stage ($E_2 = 19$ kcal/mole) is CO_2 desorption, and above 400°C it is the rate of the chemisorption ($E_3 = E_1 = 3$ kcal/mole). It is postulated that CO oxidizes via an intermediate complex involving CO_3^{2-}, and the activation energy for the dissociation $CO_3^{2-} \rightarrow CO_2 + O^{2-}$ is 40 kcal/mole.

The Catalytic Activity of Iron, Cobalt, and Nickel Oxides in Isotopic Exchange in Carbon Dioxide

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The isotopic exchange of oxygen in CO_2 was investigated between $-78°$ and $+350$°C at CO_2 pressures ranging from 4 to 200 mm Hg. The catalysts were Fe_2O_3, Co_3O_4, or NiO, which were degassed in a vacuum at 350°C and then kept under CO_2 or O_2 until establishment of a steady state. Under these conditions the exchange reaction is very fast and requires a very low activation energy. Its rate depends on the history of the catalyst.

The Mechanism of Pyridine Reaction with NiO Surfaces

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The authors present the infrared spectra of pyridine adsorbed on NiO and their change upon adsorption of oxygen. These spectra, as well as data on adsorption and charging of the surface by pyridine and oxygen, are used in postulating a mechanism of adsorption of pyridine on NiO.