

the degree to which the copper-ligand bond is ionic.

### Hydrogen Participation in the *cis-trans* Inversions of Dialkylcyclopentanes over Platinum

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The interconversions of *cis*- and *trans*-1,2-dimethylcyclopentanes over platinized charcoal take place in a stream of pure hydrogen; alternatively, the stream may contain the hydrogen in a mixture with inert gases (He, N<sub>2</sub>, or Ar) and CH<sub>4</sub>. The reaction does not proceed in the absence of H<sub>2</sub>, but the gas need only contain 1% H<sub>2</sub> for the reaction to start; at 3-5% H<sub>2</sub>, the rate becomes significant. Therefore this reaction must be considered bimolecular, since H<sub>2</sub> is a direct participant even though this does not show in the stoichiometric equations. The authors discuss several possible mechanisms and suggest a preferred one, which is formally similar to that of the Walden inversions in S<sub>N</sub>2 reactions.

### Reactions of Propylene Oxide over Various Silver Catalysts. II. Use of Metallic Aluminum Supports

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The authors studied the reactions of propylene oxide over the silver catalyst used for converting propylene to the oxide. They used metallic aluminum supports. By varying the dimensions of support particles and their treatment, they arrived at a catalyst which does not isomerize the oxide in the condition under which the latter is formed (400°C, 0.3 sec contact time).

### Oxidation of Pentenes over Copper. 1. Oxidation of Technical-Grade Amylenes over Cuprous Oxide

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The authors have studied the partial oxidation of a commercial mixture of amylenes on a cuprous

oxide catalyst in the 320°-380°C range. They have shown that the main products are ethyl acrolein and methyl isopropyl ketone, with acrolein and acetone formed in small quantities. Traces of acetaldehyde, propionaldehyde, and various five-carbon carbonyl compounds were also found. At 340°C, the yield of the partial oxidation products increases with the concentrations of oxygen and amylenes in the mixture, as well as with the space velocity. Carbon dioxide and the C<sub>5</sub>-carbonyl compounds are formed via a parallel or a parallel-consecutive reaction scheme. The authors also propose mechanisms of formation of other products, and give estimates of oxidation resistance of isomeric pentenes.

### Effect of the Energy and Number of Acid Sites of a Silica-Alumina Catalyst on Its Cracking Ability

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The authors studied two series of silica-alumina catalyst with different degrees of poisoning of proton sites of the surface and different Al<sub>2</sub>O<sub>3</sub> contents. The selectivity of the catalyst appears to depend primarily on the energy of the acid sites, rather than on their nature. The activity of these catalysts in cracking reactions also appears to be due to the presence of highly acid sites, since their removal deactivates the catalyst.

### Mass-Spectrometric Study of the Catalytic Redistribution of Hydrogen in Cyclohexene

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During reaction of cyclohexene vapor over palladium films at room temperature, the curves of accumulation of benzene and hydrogen exhibit a convexity, while that for cyclohexane shows an inflection point. If all hydrogen and other reaction products are continuously removed, the only reaction is dehydrogenation of cyclohexene to benzene. This shows that the only mechanism involved in this "irreversible catalysis," at least under the conditions employed by the authors, is that incorporating consecutive-parallel dehydrogenation and hydrogenation of cyclohexene. Dehydrogenation is not accompanied by the appearance of cyclohexadiene in the vapor.