Formation of α-Butylenes by Dehydration of n-Butyl Alcohol Over Aluminum Oxide

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Dehydration of n-butyl alcohol was studied over pure γ-Al_2O_3 and over the Al_2O_3 containing KOH as a modifier. At concentrations of 0.25% (wt), this modifier practically does not alter the dehydration characteristic of the catalyst but does decrease significantly its isomerizing ability.

At a temperature of 297° and the alcohol feed rate of 6 hr^{-1} (liquid vol. basis), the concentration of butene-1 in the gaseous products is 98.6% and the corresponding conversion per pass is 13–18%. The activation energy over the catalyst containing 0.25% KOH is 26.7 kcal/mol.

Effect of Sodium on Properties of Alumino-Platinum Catalysts

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The effect of sodium addition (0.02–2.5% wt.) on performance of an alumino-platinum catalyst was determined in dehydrogenation of cyclohexane, hydrogenation of benzene, isomerization of n-pentane, and dehydration of isopropyl alcohol.

The results show that sodium poisons the catalyst for hydrogenation of benzene and isomerization of n-pentane. However, sodium in amounts up to 0.8% (wt) promotes its activity in dehydrogenation of cyclohexane. Addition of sodium to an aluminum oxide catalyst suppresses its activity in dehydration of isopropyl alcohol but promotes it in dehydrogenation of the alcohol.

Catalytic Properties of Silicon: Dehydrogenation of Formic Acid

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The decomposition of formic acid was studied over samples of powdered silicon of electronic and hole types. These samples were prepared by grinding the monocrystals in the atmosphere of the vaporized feed. Specific activities of the silicon catalysts of the two types are approximately equal and at the like conditions are commensurable with the activity of germanium.

Retarding Effect of Ammonia in High Pressure Ammonia Synthesis

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The retarding effect of ammonia was studied in the ammonia synthesis over a fused iron catalyst. The results show that T'yomkeen-Pijov equation is valid to calculate the retarding effect at widely varying concentrations of NH_3 in the gas when the term α of the equation is 0.5. The observed decrease of the reaction rate at increased concentrations of ammonia is primarily due to a decrease in the forward reaction rate.

Novel Catalytic Properties of Yttrium Oxide

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The hydrogenation activity of yttrium oxide was determined using the simplest unsaturated hydrocarbons with double and triple bonds. The isomerization activity of the catalyst was also determined using the same hydrocarbons and the conditions to effect transfer of the double bond along the principal chain.

Photosorption and Photodesorption of Oxygen by Zinc Oxide; Product Analyses

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The mass-spectrometric analyses confirm the phenomenon of photodesorption of the zinc oxide oxygen. The conditions to reproduce repeatedly the photodesorption have been established. The results show that heating the samples made free from organic impurities causes separation of the photosorbed oxygen without a change of its state.

Distribution of Promoters in Iron Catalysts for Ammonia Synthesis

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The paper discusses the question of distribution of Al_2O_3, MgO, CaO, and K_2O promoters in iron catalysts used in ammonia syntheses—both before and after reduction. The probable behavior of the alkaline promoter during reduction of the catalyst is also considered.