Abstracts from Shokubai (Catalyst)

Shokubai (Catalyst) publishes both original articles and reviews or translations of articles appearing originally in languages other than Japanese. The following abstracts are of original Japanese language articles only.

Acidities of Silica-Alumina Catalysts

By TADAO SHIBA, MASAO SATO, HIDESHI HATTORI, AND KAZUAKI YOSHIDA

From Tokyo Institute of Technology, Meguro-ku, Tokyo, Japan

The Brönsted and Lewis acidities were studied on gel mixed, co-gelated and co-precipitated silica-alumina and alumina catalysts. The desorption products from the chemisorbed chlorotriphenylmethane, triphenylcarbinol and triphenylmethane were investigated employing IR absorption spectra. Triphenylcarbinol was the only isolated product obtained from chlorotriphenylmethane and from triphenylcarbinol in the case of alumina and silica-alumina catalysts. By desorbing triphenylmethane, chemisorbed on alumina for three months at room temperature, triphenylcarbinol was mainly obtained in a similar way. When triphenylmethane was adsorbed on alumina and silica-alumina catalysts for only a week, a small amount of triphenylcarbinol was produced and the major part of the products were unidentified. From these results, the determination of Lewis acidity was discussed.

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Kinetics of the Selective Hydrogenation of Crotonaldehyde to Crotyl Alcohol

By SEIICHI YADA AND SHIRO KUDO

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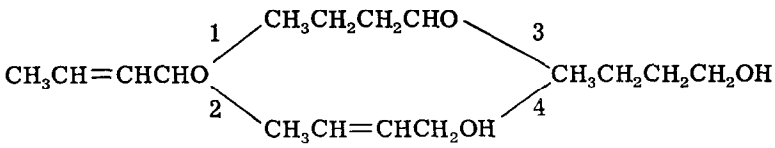
The kinetics of the catalytic hydrogenation of crotonaldehyde was studied with excess hydrogen at 200–280°C over Raney copper-cadmium catalysts. The amount of aluminum dissolved out from the alloy greatly affected the activity of the catalyst and the other factors had little influence.

The reaction scheme was considered as follows;



Each hydrogenation step was found to be first order and irreversible. The reaction pressure had little effect on the selectivity. Applying the Newton-Raphson method, the rate-equation constants were calculated with a digital computer.

The activation energies of the steps 1 and 4 were both larger than that of the step 2. Consequently, the yield of crotyl alcohol decreased at higher temperatures.

On the basis of the kinetic data, it is found that crotyl alcohol is obtainable in a good yield at 225–250°C and the maximum conversion of crotonaldehyde to the alcohol is approximately 80%.

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