

Reductive Amination of 2-Propanol to Monoisopropylamine over Co/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> Catalysts

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Reductive amination of 2-propanol for synthesis of monoisopropylamine (MIPA) is an industrially significant process. MIPA is typically used as intermediates for the synthesis of herbicides, insecticides, pharmaceutical chemicals, corrosion inhibitors, plastics, and rubber chemicals. The reductive amination of 2-propanol was conducted using Co/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> catalysts prepared by incipient wetness impregnation. The catalytic reaction was carried out in a continuous fixed-bed reactor using ammonia at atmospheric pressure. With increasing the cobalt content in the Co/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> catalyst, the conversion of 2-propanol increased. Excess ammonia and hydrogen was effective for the enhancement of the conversion and MIPA selectivity. Longer contact time increased the conversion but decreased the selectivity for MIPA. In the absence of hydrogen the catalyst deactivated but its initial activity and selectivity was recovered by re-exposing to feed containing hydrogen. Feed of excess hydrogen could efficiently hinder the oxidation of catalyst during reaction and prevent catalyst deactivation. The catalysts were characterized by X-ray diffraction (XRD), temperature-programmed reduction (TPR), N<sub>2</sub>-sorption and H<sub>2</sub>-chemisorption.