

Dehydrogenation of cyclohexanol with Tungsten-based catalysts

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Cyclohexanone is generally produced by dehydrogenation reaction of cyclohexanol. Cyclohexanone is important intermediate for the manufacture of caprolactam which is monomer of nylon. Until now, several oxidation of alcohols are produced by a large peracid as oxidant. However, peracid has many disadvantages such as expensive, hazardous, and acid waste. Recently, the catalytic oxidation of alcohols using hydrogen peroxide has received much attention from the viewpoint of green chemistry. Therefore hydrogen peroxide is an ideal oxidant for oxidation reactions because of its ease of handling and high activity as oxidant, as well as the fact that byproduct is natural product, namely water. In this study, to develop catalysts for dehydrogenation of cyclohexanol, dehydrogenation of cyclohexanol and H₂O₂ as oxidant were carried out. Also a series of Sb/WO₃ were successfully synthesized. These catalysts show different activities for 6 hours. In particular, Among series of Sb/WO₃, Sb/WO₃ 10 wt% 400 °C shows best catalytic activity in dehydrogenation reaction because of calcination effect and Sb content effect. Therefore calcination effect and Sb content effect are both important to dehydrogenation of cyclohexanol at a series of Sb/WO₃.