

Effect of Pt/Sn ratio and support on the propane dehydrogenation over the Pt-Sn-K/Al₂O₃ catalyst

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Propylene is the one of the most important petrochemical raw materials, as the value of propylene increased even more. Hence, propylene production through dehydrogenation (DH) of propane is very important. Dehydrogenation of propane is a highly endothermic and equilibrium limited reaction that require relatively high temperatures and low pressures to achieve high yields of propylene. The reaction used supported platinum catalysis. Pt has been used extensively as a catalysis for propane dehydrogenation both at laboratory and industrial scales. The purpose of this study is both high activity and high selectivity to propylene in propane dehydrogenation. Pt-Sn-K catalyst supported on θ , γ -alumina and was prepared with different amounts of Sn and the samples were dried at 120°C for 12h. Calcination was carried out at about 600°C. The effects of Pt-Sn-K catalyst for propane dehydrogenation to propylene have been investigated by reaction tests and some physicochemical characterizations like BET, XRD. Cokes of θ -alumina supported catalysts decreased so their stability was much higher than γ -alumina supported catalysts. And the catalytic performance in 0.5% of Sn was superior then the other catalysts.