

Abstract

The hydroconversion of *n*-heptane on 1 wt.% palladium supported on sulfated zirconium pillared montmorillonite (PdZMS) under isothermal and isobar conditions ($P_{HC} = 7.99$ kPa and $P_{Tot} = 101.3$ kPa) is studied. The catalyst activity of PdZMS is compared to those obtained on 1 wt.% palladium supported on γ -alumina (PdAl) and on sulfated zirconia (PdZS). The PdZMS catalyst develops an intermediary catalytic behavior between that of PdAl and that of PdZS and shows a very important isomerization selectivity at 300–330 °C. The monobranched isomers are the major reaction products formed on this catalyst and suggest a classical bifunctional mechanism. On the PdAl catalyst, it is rather a metallic mechanism characterized by hydrogenolysis on Pd particles (demethylation reaction) and by a bond shift isomerization occurring through a cyclic intermediate. On the PdZS catalyst, a high selectivity in cracking products (propane and butane) suggests a mechanism involving a cyclopropanic protonated intermediate, followed by a β -scission attributed to the strong acidity of the sulfated zirconia.