

Effect of different metal on hydrogenation and ring opening of tetralin

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The hydrogenation and selective ring opening (SRO) of tetralin catalyzed by Ir/USY, Pt/USY, Pd/USY and Ni/USY catalysts have been studied, in context of the removal of polynuclear aromatics from diesel fuel. The catalysts were prepared by impregnation method and their surfaces were characterized by H₂-TPR, XRD, NH₃-TPD, BET and TEM. Tetralin ring opening was carried out in a fixed-bed reactor at 300°C, under 30bar H₂ atmosphere, 2.3h⁻¹ of WHSV, H₂/feed molar ratio of 40. The resultant products were analyzed by GC and GC-MS analysis. At a given reaction temperature, a Pt/USY catalyst produces more amount of C10 products (and thus less cracking) than that of other catalysts with similar density of strong acid sites. When upgrading low-quality diesel cuts by using, both the lower degree of cracking and higher yields of ring-opening-product (ROP) were obtained for the processes of using Pt based catalysts, which can result in higher cetane barrel values.