

Catalytic performance of Nickel -M -alumina catalysts (M=Mg and Ca) via n -dodecane autothermal reforming

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To investigate autothermal reforming(ATR) properties for diesel of Mg(MgNA10-PM) and Ca(CaNA10-PM) catalysts, magnesium and calcium were selected as promoters of Ni -Al based catalysts. These catalysts were prepared by polymer incipient method using PMMA(poly methyl methacrylate). The catalytic activity of the catalysts were carried out in a fixed -bed reactor at 750 , S/C = 1.23, O₂/C = 0.25 and GHSV = 5000~ 12000h⁻¹. N-dodecane was selected as a surrogate for diesel fuel because it is regarded to have similar properties. MgNA10-PM and NA10-PM catalysts recorded production above 60% hydrogen selectivity and 80% n -dodecane conversion without DBT(dibenzothiophene). In the case of MgNA10-PM catalyst, its hydrogen production and n -dodecane conversion with 100ppm DBT were maintained. But NA10-PM catalyst was deactivated. In the case of CaNA10-PM catalyst, its dodecane conversion was 60% and decreased with 100ppm DBT. The catalysts were characterized by XRD, XPS, SEM -EDS and BET.