# Effect of hierarchical pore structure on steam catalytic cracking of 1-methyl naphthalene over $Ni/Al_2O_3$ catalysts

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The effect of hierarchical pore structure on steam catalytic cracking of 1-methyl naphthalene over $Ni/Al_2O_3$ catalysts has been studied. The macropores in $Al_2O_3$ support played an important role in enhancing the big reactant diffusion to the active sites, producing a higher cracking and over cracking products. Moreover, using macroporous alumina also decreases coke amount condensed on surface of catalysts, compared to mesoporous alumina. Based on product distribution of steam catalytic cracking of 1-methyl naphthalene carried out at 500°C in a fixed-bed reactor, there were two main reactions occurring: steam reforming and catalytic cracking. Both of two reactions are accelerated in presence of hierarchical macroporous structure of alumina, resulting in higher 1-methyl naphthalene conversion. The introduction of potassium onto $Ni/Al_2O_3$ also promoted steam reforming through the immigration of potassium from alumina to nickel surface.