

Steam oxidative cracking route of 1-methyl naphthalene over Ni/CZ, Ni/CZA and Ni/Al<sub>2</sub>O<sub>3</sub> catalysts

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In this study, 1-methylnaphthalene has been used as a model component to study the steam oxidative cracking of heavy oils process. The formation of active sites (oxygen vacancies) by great interactions between Ni and supports causes Ni/CZ, Ni/CZA and Ni/Al<sub>2</sub>O<sub>3</sub> employed as catalysts (10 wt.% Ni) for this process. From the reaction results conducted in a fixed-bed reactor (T=500oC, W/F= 0.17 h, P=0.1 MPa, steam/1-methylnaphthalene ratio = 3 ml/ml), the relation between active sites and some reaction routes is clearly observed. Oxidative cracking over oxygen vacant sites and hydrogenation over Ni metallic sites increase the liquid fuel yields in product. On the other hands, the valuable components such as single ring and opening-rings components are found in liquid product with high selectivity. That indicates the oxidative cracking has high selectivity for light products such as gasoline or diesel.