

A Novel Hydrocracking Phosphide Catalyst for Naphthalene Conconversion to BTX

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The hydrocracking is effective to break up the polyaromatic hydrocarbons into lighter fractions using heat and catalysts in the presence of hydrogen. From an economic point of view, high yields of valuable products among the lighter hydrocarbon such as benzene, toluene and xylene (BTX) are desirable. Bifunctional catalytic activity of hydrogenation and cracking is known to be beneficial to increase the yield of BTX. In this work, we investigated the novel Ni₂P catalysts on various support to maximize the BTX yield for the naphthalene hydrocracking

Catalytic hydrocracking of naphthalene over Ni₂P/zeolite was carried out at 623K or 673K and 3.0MPa in a upflow fixed-bed reactor using a model feed mixture containing aromatic and aliphatic compounds. Various supports were applied to investigate the effects of the supports on the yields of naphthalene hydrocracking into BTX. The yield of each product from the hydrocracking of naphthalene with various catalysts at 673K and 3.0MPa clearly demonstrate that Ni₂P/beta significantly could promote the conversion of naphthalene with an increase in the selectivity of BTX. As a result, more than 90% of BTX product selectivity was achieved over Ni₂P/beta at 673K and 3.0MPa.