Effects of the Acidic Properties and Pore Structures of Catalysts on the Catalytic Cracking of Polyolefins

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Effects of the acidities and pore structures of ZSM-5 and Al-MCM-41 catalysts on the Cracking of polyolefins(HDPE, PP and PS) were studied using a semibatch reactor system. To investigate the effect of pore structure in detail, each catalysts was silane-treated. ZSM-5 showed a higher catalytic activity for the cracking of a linear polyolefin(HDPE) due to its superior acidic properties, however, its narrow pore opening was to result less cracking activity for the branched polyolefins (PP and PS). On the other hand, Al-MCM-41 has a proper acidic properties and a large pore opening, and it was found to be compatible for the cracking of bulky oligomers and branched polyolfins.