

Catalytic cracking of polyethylene over all-silica MCM-41 molecular sieve.

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Abstract

The catalytic cracking of high-d. polyethylene was demonstrated over all-silica MCM-41 catalysts. The cracking activity increases with the degree of crystallinity of the catalysts. The pore diam. of the samples has an effect on the level of the catalytic activity, with catalysts having small pore diams. giving higher activity. A carbenium ion-mediated mechanism is proposed for the cracking reaction, as high levels of isobutene and isobutane and low levels of C and C were produced. The product distribution was compared with those obtained from thermal cracking tests. The surface acidity of the all-silica MCM-41 is attributed to the presence of silanol groups. It is proposed that the formation and stabilization of carbenium ions in the pores of the catalyst are due to the adsorption interaction between the polyethylenic fragments with the surface of the channels.