**Polymer Degradation and Stability**

Volume 46, Issue 1, 1994, Pages 57–62

Cover image

# H-ZSM-5 catalysed degradation of low density polyethylene, polypropylene, polyisobutylene and squalane: Influence of polymer structure on aromatic product distribution

Raphael C. Mordi, John Dwyer, Roy Fields



doi:10.1016/0141-3910(94)90109-0



Abstract

Low density polyethylene, polypropylene and polyisobutylene and a medium molecular weight compound, squalane, were degraded as model compounds for plastics over a H-ZSM-5 zeolite catalyst. These compounds give products that are rich in gasoline-range chemicals, which contain a number of aromatic compounds. Polyisobutylene, (PIB) with dimethyl branching on alternate carbon atoms is shown to produce very little aromatics, whereas polypropylene (PP), with methyl branching and low density polyethylene (LDPE), and with very few branches on the polymer backbone, produces high yields of aromatics, and squalane with methyl branching fairly spaced out produces still higher yields of aromatics compared with PIB. The aromatic distributions obtained from these compounds have been explained in terms of the carbon branching on the polymer and the steric effect resulting from the polymer's ingress into the zeolite channels.