

Alkylation of Isobutane/2-Butene over Modified FAU-type Zeolites

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A series of mesoporous La-zeolite X catalysts (La-x-Zeol X (x = 0, 0.25, 0.5, 0.75, 1.0, and 2.0)) were prepared by a hydrothermal method with a variation of carbon template content (x, wt%). The prepared catalysts were applied to the isobutane/2-butene alkylation. Mesopore volume of the catalysts increased with increasing carbon template content, while acidity of the catalysts decreased with increasing carbon template content. In the catalytic reaction, productivity of C8 alkylate (C8 alkylate g/g-catalyst) and selectivity for C8 alkylate showed volcano-shaped trends with respect to carbon template content. Among the catalysts, La-0.5-Zeol X showed the highest productivity and selectivity for C8 alkylate. The maximum productivity and selectivity for C8 alkylate over La-0.5-Zeol X were due to the offset of two opposite trends between mesopore volume and acidity of La-x-Zeol X catalysts.