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Methanol dehydration reaction to produce clean diesel alternative dimethylether over mesoporous aluminosilicate-based catalysts

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Abstract: Due to its good burning characteristics and high cetane number, dimethylether (DME) is considered as a highly attractive and clean alternative to diesel fuel. This ether can be produced by methanol dehydration reaction over solid acid catalysts. In the present study, activities of mesoporous aluminosilicate catalysts prepared by the hydrothermal synthesis route and containing Al/Si atomic ratios ranging between 0.03 and 0.18 were tested in methanol dehydration. The optimum Al/Si ratio was 0.09 for DME synthesis. Activity of silicotungstic acid (STA) impregnated aluminosilicate was also tested. This STA impregnated catalyst showed very high DME yield values at temperatures as low as 250 °C. DME selectivity approached unity for all the aluminosilicate catalysts over 300 °C.

Key Words: DME, aluminosilicate, silicotungstic acid, methanol dehydration.

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