

Kinetics and mechanisms of transalkylation and disproportionation of *meta*-diethylbenzene by triflic acid catalyst

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**Abstract**

The kinetics of transalkylation and isomerization of *meta*-diethylbenzene in the presence of benzene using triflic acid as a catalyst has been investigated. High catalytic activity of the triflic acid catalyst was observed in homogeneous liquid-phase reactions. On the basis of the product distribution obtained, transalkylation, disproportionation, and isomerization reactions have been considered and the main product of the reaction was ethylbenzene. These reactions are conducted in a closed liquid batch reactor with continuous stirring under dry nitrogen and atmospheric pressure over the temperature range of 288-308 K. The main transalkylation, disproportionation, and isomerization reactions occurred simultaneously and were considered as elementary reactions. The apparent activation energy of the transalkylation reaction was found to be 35.5 kJ/mol, while that of disproportionation reaction was 42.3 kJ/mol. The reproducibility of the experimental product distribution occurred with an average relative error of 2%. © 2003 Wiley Periodicals, Inc. *Int J Chem Kinet* 35: 555-563, 2003