

CH₄ Chlorination with Cl₂ Using Transition Metal Ion-Exchanged Zeolites

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Conversion of CH₄ to value-added products has been interesting subjects for a long time. Among the capable material of being produced, CH₃Cl, one of the major products of CH₄ chlorination, can be used for starting material that can be converted to hydrocarbons. However, selective production of CH₃Cl with less formation of undesirable chloromethane products is challenging since the reaction with Cl₂ is always accompanied with radical-mediated non-selective chlorination pathway. Previous studies reported that solid acid catalysts can induce polarization of Cl₂ molecule, and radical chlorination process can be shifted to ionic chlorination process. Shifting the reaction process predominantly to the ionic pathway increased the yield of CH₃Cl and decreased the production of poly-chloromethanes. In our recent study using ion-exchange zeolites series, we found that the production of CH₃Cl could be changed by the chemical properties of introduced metal ions. In this poster, we also used ion-exchanged zeolites which transition metal ions as the catalysts for selective production of CH₃Cl. The resultant series of catalysts exhibited significantly different phenomenon on the CH₃Cl production.