

## Development of high performance catalysts for selective methane chlorination

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Methane is an important feedstock for the synthesis of fuels and chemicals. Commercially available methane conversion is indirect process via syngas, which is energy intensive and expensive. Recently, direct conversion of methane to chemicals under mild conditions has received increased attention. Among various approaches, methane halogenation is an efficient process for the transformation of methane to intermediate mono-methyl halide to further produce higher hydrocarbons or oxygenates such as light olefins and alcohols. Chlorine is the most widely used halogen in industry as a building block for the production of various chemicals. The use of chlorine in methane halogenation is beneficial due to high availability and low price of chlorine. Also, excess chlorine, which is harmful to environment and human health, can be effectively consumed via methane chlorination process. However, thermal methane chlorination follows a free-radical mechanism yielding low selectivity to desired mono-methyl chloride. In this talk, I will present several approaches to produce methyl chloride selectively using various heterogeneous catalysts including zeolites, carbons, and sulfated metal oxides.