

Selective oxidation of methane over zeolite-based catalysts

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Methane can be a promising chemical feedstock as long as its direct conversion can be achieved with high yields under mild reaction conditions. Until now, lots of works have been done to convert methane directly into methane oxygenates such as methanol, formaldehyde, and formic acid. In this presentation, two different catalytic conversion systems will be discussed. The one is the liquid-phase oxidation of methane over Fe-based zeolites using hydrogen peroxide. In this case, the active sites, Fe clusters, appear to be critical to control the turnover frequency and efficiency of hydrogen peroxide. The other is the gas-phase oxidation of methane over Cu-based zeolite using water as an oxidant. The continuous production of methanol can be achieved over Cu-zeolites even in the absence of oxygen.