Partial Oxidation of Methane to Methanol with CO_2 over Metal Modified Zeolite Catalysts

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One of the technologies that are gaining prominence is the utilization of CO_2 as an oxidant for catalytic transformations. Most of the oxidative transformation requires reductants when oxygen is used as an oxidant, however molecular oxygen, gives rise to combustion of hydrocarbons (especially at high quantities) and thus may not be particularly effective for improving selectivity. In the case of methane conversions into oxygenates such as methanol and acetic acid, simultaneous activation of C-H bond of methane and oxidant are required which have been known as very tough challenge due to the thermodynamic unfavorability. In this study we have successfully illustrated the possibility of formation of methanol using CO_2 under concurrent feeding with methane in the continuous flow fixed-bed reactor over Cu loaded zeolite catalysts