

Methane Oxidation to Methanol Precursor using Homogeneous Catalyst in Acid Media

이현주[†]

KIST

(hjlee@kist.re.kr[†])

Catalytic activation of methane to valuable chemical such as methanol is an important issue from both a practical and academic standpoint. Due to its abundance and innocuous property, molecular oxygen-mediated direct oxidation of methane to methanol using a heterogeneous catalyst has been studied extensively. However, a high reaction temperature and the trade-off between conversion and selectivity limit this method due to the thermochemically stable methane and relatively less stable product, methanol. One way to overcome this dilemma is to oxidize methane to a methanol intermediate such as methyl bisulfate ($\text{CH}_3\text{OSO}_3\text{H}$), methyl trifluoroacetate ($\text{CF}_3\text{CO}_2\text{CH}_3$), and methyl acetate ($\text{CH}_3\text{CO}_2\text{CH}_3$) by conducting the oxidation in the acid media such as H_2SO_4 , $\text{CF}_3\text{CO}_2\text{H}$, $\text{CH}_3\text{CO}_2\text{H}$, respectively. In this presentation, we review the recent catalyst development trends at the liquid-phase methane oxidation performed in acid media.