

Effect of aluminum phosphate binder on the methanol to propylene (MTP) reaction over HZSM-5 catalysts

이기용, 이한규, 임선기*

KAIST

(skihm@kaist.ac.kr*)

The influence of the aluminum phosphate (AP) binder on the acidity and performance of HZSM-5 ($\text{SiO}_2/\text{Al}_2\text{O}_3=80$, Zeolyst) catalysts in the methanol to propylene (MTP) reaction was studied. The porosity and strong acidity of HZSM-5 catalysts decreased with increasing AP content. Catalytic performance of AP bound catalyst was completely different depending on the binder content. Low content (≤ 10 wt%) of AP resulted in a dramatically enhanced propylene selectivity. On the other hand with high content (≥ 20 wt%) of AP, methanol was mostly dehydrated into DME without further transformation into hydrocarbons. It is found that there is an optimum AP content related to the acidity of HZSM-5 catalyst to obtain higher propylene selectivity. The HZSM-5 catalyst with AP of 10 wt% showed the highest propylene selectivity due to the decrease in strong acidity induced by the phosphorous compounds (H_2PO_4^-).