

Methane Aromatization over Mo-M/HZSM-5(M=Zn, Ga)

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Direct transformation of methane into aromatics have evoked a great interest in the view points of value-added aromatics production as well as utilization of abundant fossil resources such as natural and shale gases. However, current methane aromatization suffers from serious coke formation, fast deactivation and thermodynamic limitation, which gives low conversion of methane and selectivity on benzene as well.

Mo supported ZSM-5 is the mostly proposed catalyst for methane aromatization, but it is known that it has a limit to improve in itself. So, it requires some strategies for overcoming thermodynamic barriers. There has been an observation that Zn and Ga-HZSM-5 also have aromatization activity on lower alkanes rather than methane. In this study, methane aromatization was studied by combining Zn or Ga onto Mo-HZSM-5. Moreover Mo-HZSM-5 is supposed to be operated only non-oxidatively due to the Mo₂C as an active site even hydrogen is co-produced.

In this study, catalytic aromatization of Mo-M/HZSM-5(M=Zn or Ga) was prepared by co-impregnation and investigated under non-oxidative and partial oxidative condition.