

Adsorption and catalytic oxidation of volatile organic compounds on silver loaded hydrophobic zeolites

백세원, 김정랑, 임선기*
한국과학기술원 생명화학공학과
(sklhm@kaist.ac.kr*)

To design a good combined adsorbent/catalyst dual functional system for the control of the low concentration VOC, both adsorption and catalytic activity test over metal loaded zeolite HY were carried out. Hydrophobic HY zeolite was selected as a good adsorbent candidate among the tested zeolite adsorbents and extended to the catalyst support material by adding various transition metals. The temperature programmed surface reaction (TPSR) of toluene and methylethylketone (MEK) suggested the silver as the best candidate among the tested transition metals. Temperature programmed reductions (TPR) and O₂-temperature programmed desorption (O₂-TPD) on Ag/HY catalysts were carried out to explain the nature of active centre of Ag catalyst for the toluene oxidation. Silver oxide species or partially oxidized metallic silver on to the surface of metallic silver phase was proposed as an active redox site during the oxidation reaction.