Superior performance of MnO_2-SnO_2 nanocomposite catalysts for the oxidative dehydrogenation of ethylbenzene to styrene with CO_2

버리 데이비드 라쥬, 한상철, 박상언*
인하대학교
(separk@inha.ac.kr*)

Styrene is one of the important chemical intermediate for the production of polystyrene, resins, and other important petrochemicals. At present styrene is produced mainly by the dehydrogenation of ethylbenzene over iron based catalysts in the presence of superheated steam, which is being wasted at the gas-liquid separator, consequently, there has been huge hike in the production cost. Recently, CO_2 has been under investigation to replace the super heated steam. Since the present commercial iron based catalyst system is ineffective in the CO_2 atmosphere, research has been directed towards the development of catalysts which are sustainable in the presence of CO_2. In this context, several mixed metal oxide catalysts succeeded for the dehydrogenation of ethylbenzene in the presence of CO_2 in a certain extent as reported in our previous publications. In the present study MnO2-SnO2 nanocomposite catalysts exhibited a superior activity both in the conversion (60-70%) of ethylbenzene and the selectivity (>95%) of styrene.