

Hydrogen production by decomposition of ethane-containing methane over carbon black catalysts

윤광우, 김미소, 곽정훈, 윤기준*
성균관대학교 화학공학과
(kijyoon@skku.edu*)

Hydrogen production was studied by decomposing methane with small amounts of added ethane over various carbon black catalysts at 1073 ~ 1223 K. When the decomposition in the presence of carbon black was compared with the non-catalytic thermal decomposition, the former exhibited significantly higher hydrogen yields. With increasing temperature above 1123 K, the yield of ethylene, the primary product of ethane decomposition, decreased and the yield of hydrogen increased. The apparent methane conversion decreased at intermediate temperature ranges. This decrease is because, while the methane fed is decomposed on one hand, methane is simultaneously produced by the ethane decomposition on the other hand. The added ethane promoted methane decomposition at and below 1173 K, but it inhibited methane decomposition above 1173 K.