Mesoporous cobalt-manganese oxide catalysts for preferential CO oxidation in H_2-rich stream

김명실, 이정화, 이은옥, 김지만*
성균관대학교
(jimankim@skku.edu*)

Hydrogen, the fuel of PEMFC, is produced via the reforming of hydrocarbons and water-gas shift reaction were contains 0.5vol % - 2.0 vol % CO, which can poison Pt anode. Therefore, the concentration of CO must be reduced to below100ppm. It is known that the preferential oxidation (PROX) of CO in H_2-rich is the simplest and cost-effective routes for the removal of CO in H_2. The catalysts reported for PROX include supported noble metal catalysts such as Pt , Rh , Ru and Au catalysts and transition metal oxide catalysts, such as Co_3O_4, MnO_2 , $CuO-CeO_2$, Co_3O_4- CeO_2 has been recognized as one of the promising candidates. Among these the Co_3O_4 was known to exhibit good catalytic performance for the oxidation of CO by O_2 at lower temperatures. Also manganese catalysts recognize as a promoter cobalt oxide and copper oxide catalysts. Adding MnO_x can be improved catalysts dispersion and interaction between support and active metal.

In this present work, we were synthesized mesoporous $Co_{3-x}Mn_xO_4$ catalysts by using nano-replication method from mesoporous silica template of KIT-6. The mesoporous $Co_{3-x}Mn_xO4$ catalysts exhibited high catalytic activity compared with both Co_3O_4 and Mn_2O_3.