

Preferential CO oxidation over Mesoporous $\text{Co}_{3-x}\text{Mn}_x\text{O}_4$ Catalysts

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Hydrogen, the fuel of PEMFC, is produced via the reforming of hydrocarbons and water-gas shift reaction which contains 0.5 vol%– 2.0 vol% CO, which can poison Pt anode. Therefore, the concentration of CO must be reduced to below 100ppm. 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-CeO₂, Co_3O_4 -CeO₂ 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 $\text{Co}_{3-x}\text{Mn}_x\text{O}_4$ catalysts by using nano-replication method from mesoporous silica template of KIT-6. The $\text{Co}_{3-x}\text{Mn}_x\text{O}_4$ catalysts exhibited high catalytic activity compared with both Co_3O_4 and Mn_2O_3 .