

Effect of Co/Ni ratios in cobalt nickel oxide catalyst on methane combustion

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(dohkim@snu.ac.kr*)

Methane is an important energy resource and main component of natural gas. Natural gas vehicles (NGVs) are economic and environmentally friendly compared to gasoline and diesel vehicles. However, emission of unburned methane from NGVs is a potent greenhouse gas because its global warming potential is 21 times higher than that of CO₂ equivalent.

In this study, we used cobalt nickel oxide catalysts to reduce unburned methane in the methane combustion and synthesized cobalt nickel oxide catalysts with different Co/Ni ratios using co-precipitation method. We investigated the effect of Co/Ni ratios in cobalt nickel oxide catalysts on the physicochemical properties and performance of methane combustion using several techniques, such as ICP, BET, XRD, H₂-TPR, XPS and EXAFS.