

Combined steam and CO₂ reforming with CH₄ on Ni/CeO₂-ZrO₂-modified MgAl₂O₄: Effect of Ce/Zr weight ratio

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Due to the increased demand for the production of clean synthetic fuels using syngas, which could be derived from the various reforming processes of hydrocarbons, the efficient reforming catalysts have been largely investigated for last several decades. The reforming catalysts for the combined steam and CO₂ reforming with CH₄ were investigated on Ni/CeO₂-ZrO₂-modified MG30 (weight ratio of MgO/Al₂O₃=3/7, MgAl₂O₄) catalyst to verify the effects of Ce/Zr weight ratio at a fixed nickel weight ratio of Ni/(Ce+Zr)=1.0/0.1 with 12wt%Ni on MG30 support. The catalysts were prepared by co-precipitation method using nickel, zirconium and cerium nitrate precursors with a precipitant of Na₂CO₃. The catalyst possessing an equal weight ratio of Ce/Zr was found to show the highest catalytic activity, and it was verified by characterizing the particle size variation of nickel species and its reducibility.