

Ni/SiO₂@SiO₂ Catalysts with Different Ni Particle Size for Dry Reforming of Methane with Reduced coking formation

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Recently, a demand for alternative energy resource is increased because of lack of fossil energy resource and greenhouse effect caused by greenhouse gases such as CO₂ and CH₄. To not only reduce greenhouse gases but also generate energy source or syngas, dry reforming of methane (DRM) reaction has studied actively. Among various metal catalysts, Ni catalysts show high activity for this reaction with very cheap cost, but have lower stability than precious metal catalyst because of its catalytic deactivation via particle sintering and coke formation.

In this study, we have investigated synthesis method of silica coated Ni supported catalysts with different Ni nanoparticle size to prevent agglomerating particles and to confirm size effect of Ni particle for this reaction. Characterization of catalysts and estimation of dry reforming of methane reaction activities were also carried out. The synthesized catalysts were characterized by (HR)TEM, TPO, TGA, ICP, ect.