

Sinter- coke-resistant nickel catalyst for dry reforming of methane reaction (DRM)

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Recently, a demand for reduction of greenhouse gas is increased because of greenhouse effect caused by CO₂ and CH₄. Among various reforming reactions, dry reforming of methane (DRM) reaction has studied actively. Because DRM reaction generates CO and H₂ (syngas) gas at ratio 1. And syngas is energy source for alternative energy. In comparison with the noble metal, Ni catalysts show good activity for this reaction and have very cheap cost, but have poorer durability than noble metal catalyst because of particle sintering and coke formation.

Here, we have synthesized Silica-coated Ni/SiO₂ catalyst with 5.2nm Ni nanoparticle in size, showed high durability for DRM reaction performed at 1073K. The catalyst maintained its initial activity for 170hrs, while Ni/SiO₂ catalyst without coating didn't retain initial activity and showed severe degradation caused by Ni sintering and coke formation.