

## Hydrogen Production by Steam Reforming of Methane over Modified Ni based Catalysts

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Steam reforming(SR) of methane is an extremely important process in the production of syngas and hydrogen. Ni based catalysts supported on ceramic material (e.g. Al<sub>2</sub>O<sub>3</sub>, CaAl<sub>2</sub>O<sub>4</sub>, etc.) are conventionally used in the SR of Methane. However, coke formation, sintering and low thermal conductivity are still considered as major issues for commercial applications of these catalysts.

In this research, we aimed to develop structured catalysts with high thermal conductivity which enables the catalyst with higher heat transfer along the catalytic bed, affording high performance with a flattened radial temperature gradient.

Modified Nickel based Catalysts supported on SiC-Calcium aluminate were prepared by extrusion and impregnation methods. The catalysts were characterized by TEM, SEM, XPS, XRD, TPR and N<sub>2</sub>-physisorption techniques. The catalytic performance was investigated in the SR of methane under 800~850 °C, 1 bar and GHSV of 30,000 h<sup>-1</sup>. It was found that SiC modified catalyst showed higher methane conversion in comparison to none modified catalyst. This high performance aligned with characterization results confirmed the proper influence of increased thermal conductivity of catalyst.