

Syngas production by the SCR of methane over Ca modified hydrotalcite catalyst

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The Steam CO₂ reforming(SCR) reaction of methane for the production of syngas was investigated over Ca modified Ni based catalysts. The Ca-Ni based catalysts were prepared by the solid phase crystallization and impregnation methods. The catalysts before and after the reaction were characterized by N₂ physisorption, CO chemisorption, TPR, XRD, SEM and TEM techniques. The H₂/CO ratio produced in the SCR of methane showed a strong dependence on the feed composition. The conversion of CH₄ was increased with increasing the concentration of steam and CO₂ in the feed. For Fischer-Tropsch synthesis reaction, the feed ratio of CH₄/H₂O/CO₂ for the production of H₂/CO=2 was estimated by the modeling of commercial simulation package, and identified in the fixed bed reactor system. It was found that the Ca modified Ni based hydrotalcite catalyst showed higher catalytic stability with the restriction of the carbon formation in the SCR of methane under the tested condition.