

Highly Coke Resistant Ni/MgO/Al₂O₃ Catalyst to Produce Synthesis Gas from Combined Reforming of Methane

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Highly coke resistant Ni/MgO/Al₂O₃ catalysts have been designed and applied for combined steam and carbon dioxide reforming of methane (CSCRM) to develop a candidate catalyst to produce synthesis gas (H₂/CO = 2), which is suitable for gas to liquid (GTL) process. Ni/Al₂O₃ catalysts have been promoted with varying the MgO content by incipient wetness method. The coke formation in used catalysts was examined by SEM and TGA, respectively. The catalyst prepared with 20wt% MgO exhibits the highest catalytic performance and has high coke resistance in CSCRM due to enhanced CO₂ adsorption, the increase in base strength and strong metal to support interaction (SMSI).