

Ni/MgO-MgAl₂O₄ catalysts with bimodal pore structure for steam-CO₂-reforming of methane

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Ni-base structured catalysts have been widely used on the steam CO₂ reforming of methane for the production of syngas in GTL-FPSO. Much efforts are still necessary to achieve high catalytic activity by elaborate control over the morphology and structure of nano-structured catalysts.

Bimodal pore catalyst supports are reported to be high catalytic activity and the active phase can be dispersed well throughout the pore system, thus making possible to obtain a large active surface area per unit weight.

For this study, bimodal catalyst supports consisting of MgO-MgAl₂O₄ composite with meso-macro pore structure were fabricated from decomposition of pellet mixtures of MgCO₃ synthesized under a supercritical carbon dioxide. After Ni impregnation, the Ni-based structured catalysts were carried on structural and catalytic activity studies at various conditions.

As a result, an enhancement in catalytic activity of catalysts with bimodal structures by the conversion of CH₄, CO₂ was found due to the enhanced dispersion and mass transfer in the pores.