

عنوان مقاله:

Impregnation vs. Sol-Gel Synthesis and Physicochemical Characterizations of Ni/Al₂O₃-MgO Nanocatalyst Used for Dry Reforming of Methane

محل انتشار:

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خلاصه مقاله:

Carbon dioxide reforming of methane is an interesting route for synthesis gas production. The present research deals with catalyst development for dry reforming of methane with the aim of reaching the most stable catalyst. Effect of preparation method, one of the most significant variables, on the properties of the catalyst was taken in to account. The Ni/Al₂O₃-MgO catalysts were prepared via sol-gel and impregnation methods and characterized with XRD, FESEM, FTIR and BET techniques. The reforming reactions were carried out using constant feed ratio and gas hourly space velocity (GHSV) at different reaction temperatures to identify the influence of reaction temperature. FESEM images indicate uniform particle size distribution for the samples synthesized with sol-gel method. It has been found that the sol-gel method has the potential to improve catalyst desired properties resulting in catalytic performance enhancement. The highest yield of products was obtained at 850°C for both of the catalysts. During the 10 h stability test, H₂ and CO yield gained higher values in the case of sol-gel made catalyst compared to impregnated one.

کلمات کلیدی:

Dry reforming, Synthesis gas, Ni/Al₂O₃-MgO, Nanocatalysts, Sol-Gel, Impregnation

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