

## Hydrogen Production by Steam Reforming of Glycerol over Spherical Ni-based modified Catalyst

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During the synthesis of biodiesel from biomass, about 10% of glycerol was formed as a main byproduct. Increasing biodiesel production has resulted in over-production of glycerol. Steam reforming (SR) of glycerol is one of the common processes to produce hydrogen or synthesis gas. And Ni-based catalysts are widely used in SR of glycerol. In this study, the structured M-Ni/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub>, (M : K, Ca, Sr) catalyst were prepared by dry impregnation method. All catalysts have been employed for SR under at atmospheric pressure, 800 °C with gas hourly space velocity (GHSV) of 10,000 h<sup>-1</sup> and feed molar ratios of Steam/Carbon=3. The prepared catalysts before and after the reaction were characterized by N<sub>2</sub> physisorption, XRD, TPR, TGA, SEM-EDX, and TEM techniques. It was found that the addition of alkali promoter on Ni/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> inhibited methane formation in the SR of glycerol under the tested conditions. Moreover, the presence of alkali metal on Ni/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> also promoted the stability of the catalyst through suppression of coke formation.