

CO₂ Reforming of Glycerol over La-Ni/Al₂O₃ Catalyst: A Longevity Evaluative Study

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ABSTRACT

This paper reports on the longevity of glycerol-dry (CO₂) reforming over the lanthanum (La) promoted Ni/Al₂O₃ catalysts. The XRD results showed that the Ni particle was well-dispersed in the presence of La promoter. In addition, via the NH₃-TPD analysis, it was found that the La promoter has reduced the acidity of Ni catalyst which may have explained the mitigation of carbon laydown. It was determined that the 3.0 wt% La-promoted Ni/Al₂O₃ catalyst possessed the largest BET specific surface area of 97 m²·g⁻¹. Consequently, it yielded the best catalytic longevity performance with conversion attained more than 90%, even after 72 h of reaction duration. Significantly, it can be confirmed that the presence of CO₂ during the glycerol dry reforming was essential in reducing carbon deposition, most likely via gasification pathway. This has ensured a stability of catalytic activity for a long reaction period (72 h).

KEYWORDS: CO₂ reforming; glycerol; lanthanum; longevity; syngas

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