

## Hydrogen-rich syngas production from biogas reforming by gliding arc plasma-catalyst minireactor

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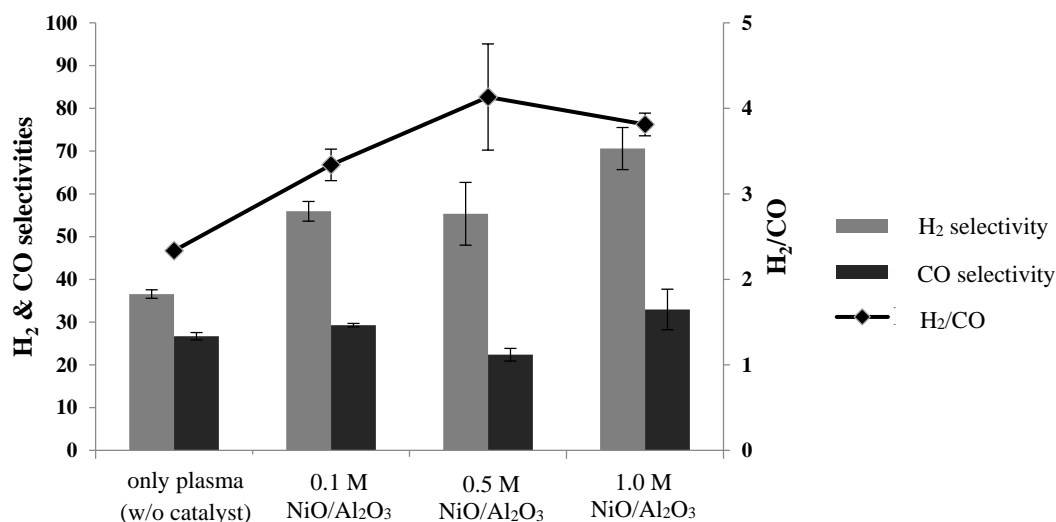
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This research aim was to investigate the production of H<sub>2</sub>-rich syngas from simulated biogas waste using a developed gliding arc plasma minireactor integrated with nickel-based catalysts. Different catalysts of NiO/Al<sub>2</sub>O<sub>3</sub>, NiO/molecular sieve 5A and NiO/ZSM-5 zeolite were characterized by BET surface area analyzer and scanning electron microscope. The integration of NiO/Al<sub>2</sub>O<sub>3</sub> catalysts into gliding arc plasma minireactor gave the remarkable enhancement of H<sub>2</sub> product in syngas with H<sub>2</sub>/CO molar ratio of higher than 3. The tendency of H<sub>2</sub> selectivity was increased in the condition of higher NiO loading on Al<sub>2</sub>O<sub>3</sub> support. Using NiO/Al<sub>2</sub>O<sub>3</sub> catalyst in this plasma system lead the synergistic effect on H<sub>2</sub> selectivity, as compared the only plasma system. The gliding arc plasma minireactor of this work performed the biogas reforming better than other low-temperature plasma such as conventional dielectric barrier discharge system.



**Keywords:** Biogas reforming; Syngas; Gliding arc plasma