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## Hydrogen-rich syngas fermentation for bioethanol production using *Sacharomyces cerevisia*

( Article in press )

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### Abstract

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Bioethanol is an eco-friendly biofuel due to its merit that makes it a top-tier fuel. The present study emphasized on bioethanol production from hydrogen-rich syngas through fermentation using *Sacharomyces cerevisia*. Syngas fermentation was performed in a tar free fermenter using a syngas mixture of 13.05% H<sub>2</sub>, 22.92% CO, 7.9% CO<sub>2</sub>, and 1.13% CH<sub>4</sub>, by volume. In the fermentation process, effects of various parameters including syngas impurity, temperature, pH, colony forming unit, total organic carbon and syngas composition were investigated. The yield of bioethanol was identified by Gas chromatography-Mass spectrometry analysis and further, it was confirmed by Nuclear magnetic resonance (<sup>1</sup>H) analysis. From GC-MS results, it is revealed that the concentration of bioethanol using *Sacharomyces cerevisiae* was 30.56 mmol from 1 L of syngas. Thus, hydrogen-rich syngas is suited for bioethanol production through syngas fermentation using *Sacharomyces cerevisiae*. This research may contribute to affordable and environment-friendly bioethanol-based energy to decrease the dependency on fossil fuels. © 2019 Hydrogen Energy Publications LLC

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