



Title: Effect of Environmental Parameters on hydrogen Production using Clostridium Saccharoperbutylaceticum N1-4(ATCC 13564)

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Abstract: Problem statement: Hydrogen gas production by Clostridium can be improved by several ways through media formulation, or suitable environment condition. This study was carried out to investigate the environmental factors effects on hydrogen production using Clostridium saccharoperbutylaceticum N1-4 (ATCC 13564). Approach: The environmental factor studied includes initial substrate concentration, initial medium pH, temperature, sparging nitrogen and addition of Fe<sup>2+</sup>. Results: The result showed that the best yield of hydrogen produced (YP/S) was 3.10 mol (mol glucose)<sup>-1</sup> when an initial glucose concentration was 10 g L<sup>-1</sup>, initial pH 6.0±0.2 at temperature 37°C. The volume of hydrogen produced was decreased when higher initial glucose concentration was applied. The yield of hydrogen increased when Fe<sup>2+</sup> added to medium at concentration of 25 mg L<sup>-1</sup>. The yield and growth were further increased by sparging with nitrogen gas. Conclusion: It was observed that the best condition for highest hydrogen yield when initial pH 6.0± 0.2 at 37°C and enhanced by adding ferrous sulfate in anaerobic process.