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Effect of pre-treatment palm oil mill effluent POME on biohydrogen production by local isolate clostridium butyricum (Conference Paper)

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Abstract

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Palm oil mill effluent (POME) contains approximately 6% fiber. The effectiveness of pre-treatment on POME can serve a very good feedstock for hydrogen production in fermentation process. In this research, the effectiveness of pre-treatment methods on POME treated using acid and base were analysed based total carbohydrate and reducing sugar content. By using 1M NaOH with heat treatment, 26.12% carbon source converted to reducing sugar while by using 1M H₂SO₄ with heat treatment, over 32.09% carbon source converted to reducing sugar. The highest increment of total carbohydrate where from acid-heat treatment with 26.1% increment from initial concentration. At the initial pH (5.5) with fermentation temperature 37°C, the highest hydrogen production rate given by acid-heat treatment was 0.5mL H₂/mL POME. Different for initial pH 7.0 with the same temperature, the highest hydrogen produced rate was given by base-heat treatment with 0.59 mL H₂/mL POME. The production of hydrogen in 2L bioreactor given much higher hydrogen production compare to production in serum bottle. This fermentation was run in batch mode with initial pH 7 and control at 5.5. The maximum hydrogen produce was 4304 mL H₂/ L POME from acid-heat treatment. © (2011) Trans Tech Publications.

SciVal Topic Prominence [i](#)

Topic: Hydrogen production | Fermentation | mol H₂/molProminence percentile: 99.786 [i](#)

Author keywords

[Batch mode](#) [Biohydrogen](#) [Palm oil mill effluent \(POME\)](#) [Pre-treatment](#)

Indexed keywords

Engineering uncontrolled terms

[Acid-heat treatment](#) [Batch modes](#) [Bio-hydrogen](#) [Bio-hydrogen production](#) [Carbon source](#) [Clostridium butyricum](#) [Fermentation process](#) [Fermentation temperature](#) [Hydrogen production rate](#) [Initial concentration](#) [Initial pH](#) [Palm oil mill effluent \(POME\)](#) [Palm oil mill effluents](#) [Pre-Treatment](#) [Pretreatment methods](#) [Production of hydrogen](#) [Reducing sugars](#) [Serum bottles](#) [Total carbohydrates](#)

Engineering controlled terms:

[Chemical engineering](#) [Effluents](#) [Fermentation](#) [Heat treatment](#) [Hydrogen](#) [Hydrogen production](#) [Organic compounds](#) [pH](#) [Sugars](#) [Vegetable oils](#)
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