

## Influence of Nutrient Addition On the Bioethanol Yield From Oil Palm Trunk Sap Fermented by *Saccharomyces Cerevisiae*

Mohd Nasir Nor Shahirah<sup>a</sup>, Jolius Gimbut<sup>a, b, c</sup>, Sook Fun Pang<sup>a</sup>, Rossyuhaida Mohd Zakria<sup>a, c</sup>, Chin Kui Cheng<sup>a, b</sup>, Gek Kee Chua<sup>a</sup>, Mohd Fazli Farida Asras<sup>c</sup>

<sup>a</sup> Faculty of Chemical & Natural Resources Engineering, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia

<sup>b</sup> Centre of Excellence for Advanced Research in Fluid Flow (CARIFF), Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia

<sup>c</sup> Faculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia

### ABSTRACT

This paper presents the influence of nutrient addition namely  $MgSO_4$ ,  $C_3H_7NO_2$ ,  $(NH_4)_2SO_4$  and  $Na_2HPO_4$  to the bioethanol yield from oil palm trunk saps (OPTS) with fermentation carried out by *Saccharomyces cerevisiae*. The sugar and ethanol contents in the sample were determined using a high-performance liquid chromatography. Nutrient addition has improved the bioethanol yield markedly, with the average yield ranged from 58.50% to 77.12% compared to about 51.08% without nutrient addition. The highest bioethanol yield (81.89%) was achieved by adding  $MgSO_4$ . The rank of nutrient influence on improving the bioethanol yield was  $MgSO_4 > C_3H_7NO_2 > (NH_4)_2SO_4 > Na_2HPO_4$

**KEYWORDS:** Ethanol; Fermentation; Yeast; Nutrient addition; Oil palm trunk sap

**DOI:** [10.1016/j.jiec.2014.08.018](https://doi.org/10.1016/j.jiec.2014.08.018)