

Biosynthesis of Poly(3-Hydroxybutyrate) (Phb) by *Cupriavidus Necator* H16 From Jatropha Oil As Carbon Source

Abeed Fatima Mohidin Batcha, D. M. Reddy Prasad, Maksudur R. Khan, Hamidah Abdullah
Faculty of Chemical Engineering and Natural Resources, Universiti Malaysia Pahang

ABSTRACT

Poly(3-hydroxybutyrate) (PHB) is a biodegradable polymer that can be synthesized through bacterial fermentation. In this study, *Cupriavidus necator* H16 is used to synthesize PHB by using Jatropha oil as its sole carbon source. Different variables mainly jatropha oil and urea concentrations, and agitation rate were investigated to determine the optimum condition for microbial fermentation in batch culture. Based on the results, the highest cell dry weight and PHB concentrations of 20.1 and 15.5 g/L, respectively, were obtained when 20 g/L of jatropha oil was used. Ethanol was used as external stress factor and the addition of 1.5 % ethanol at 38 h had a positive effect with a high PHB yield of 0.987 g PHB/g jatropha oil. The kinetic studies for cell growth rate and PHB production were conducted and the data were fitted with Logistic and Leudeking–Piret models. The rate constants were evaluated and the theoretical values were in accordance with the experimental data obtained.

KEYWORDS: *Cupriavidus necator* H16; External stress factor; Jatropha oil; Poly(3-hydroxybutyrate) (PHB); Kinetic model

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