

**CURRENT RESEARCH  
AND DEVELOPMENT IN  
BIOTECHNOLOGY  
ENGINEERING  
AT IIUM**

**VOLUME I**

Editors:

Suleyman Aremu Muyibi  
Mohammed Saedi Jami  
Zaki Zainudin



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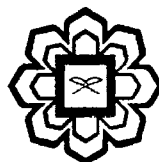
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### MICROBIAL FERMENTATION FOR PRODUCING SURFACE ACTIVE AGENT BY USING PALM OIL MILL EFFLUENT ISOLATE

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#### ABSTRACT

Biosurfactants have the unique properties that allow their use and possible replacement of chemically synthesized surfactants in a great number of industrial operations. In spite of the advantages, the economics of biosurfactant production have not received attention, and economic strategies must be devised if they are to compete with chemical surfactants. One strategy that can be used for enhancing biosurfactant production is by formulating optimum nutritional requirement during fermentation. In this study Plackett-Burmann design was used to screen the important nutrients responsible for triggering biosurfactant release. Next, Central Composite Design (CCD) was then used to find the optimum value for significant media followed by the validation of developed regression model.

*Keywords:* biosurfactant, plackett-burmann, central composite design, media optimization

#### INTRODUCTION

Several different microbial products that exhibit surface-active properties have been identified in the past. These so called biosurfactants are produced by certain bacteria and by a number of yeasts and filamentous fungi. Because biosurfactants are readily biodegradable and can be produced in large amounts by microorganisms and thus are not dependent on petroleum-derived products, they might well be able to replace, in some instances, the traditional synthetic surfactants. Biosurfactants can be efficiently used in handling industrial emulsions, control of oil spills, biodegradation and detoxification of industrial effluents and in bioremediation of contaminated soil. Being a complex organic molecule with specific functional groups, are often specific in their action (Rosenberg, 1993). This would be of particular interest in detoxification of specific pollutants, de-emulsification of industrial emulsions, specific cosmetic, pharmaceutical and food applications. Other applications include herbicides and pesticides formulations, detergents, health care and cosmetics, pulp and paper, coal, textiles, ceramic processing and food industries, uranium ore-processing and mechanical dewatering of peat (Cooper et al., 1988).