

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

**VOLUME I**

Editors:

Suleyman Aremu Muyibi  
Mohammed Saedi Jami  
Zaki Zainudin



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*(VOLUME I)*

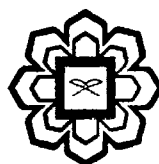
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**Department of Biotechnology Engineering  
Faculty of Engineering  
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## CHAPTER 9

### OPTIMISATION OF CHROMATOGRAPHY CONDITION FOR BIOPHENOLS SEPARATION FROM OIL PALM FRUIT FIBER

Parveen Jamal, Shahrul Yahaya, Md Zahangir Alam, Azlin Azmi

Department of Biotechnology Engineering, Faculty of Engineering, International  
Islamic University Malaysia, Gombak, 50728 Kuala Lumpur, Malaysia

#### ABSTRACT

Optimization was done to determine the best peak resolution. It was done in two stages, single factor optimization using different eluent gradient and two factors optimization, where two parameters were chosen; flow rate and solvent concentration. Optimized condition from first stage was used as centre point for second stage optimization. Full factorial designs were chosen and statistical analysis was done using Statistica. Best peak resolution was observed at flow rate and percentage of methanol at 1.5 mL/min and 2%, respectively. The optimum resolution peak is 3.38 min/cm.

*Keywords:* palm fruit fiber, HPLC resolution, optimisation, biophenol.

#### INTRODUCTION

High performance liquid chromatography (HPLC) is known to be one of the most effective methods for analyzing the substance mixtures of complex composition. A great number of various organic substances of different nature and properties required various technical approach and instrumentations to separate complex mixtures, identify and determined their components. HPLC coupled to a UV photodiode array detector (LC/UV) has been widely used for the analysis of crude plant extracts. The UV spectra of natural products obtained on-line by LC/UV give useful information on the type of constituents and in the case of certain classes of compound, such as the polyphenols, indications of oxidation patterns (Hostettmann, 1984).

Phenolic compound, like flavonols are usually analyzed by reverse-phase liquid chromatography. Most HPLC methods perform separation by gradient elution with spectrophotometric UV diode array detection. Fluorimetric and electrochemical detection have also been applied to enhance the sensitivity and selectivity of detection in HPLC. Much work has also been published on the application of HPLC coupled with mass spectrometry for the analysis of polyphenols. (Careri et al., 2003; Molnar-Perl).

In this study the optimization of process parameter of chromatography for the separation of biophenols is presented.