

**DETERMINATION OF HYDROQUINONE IN  
SKIN WHITENING PRODUCTS BY  
HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC)  
EQUIPPED WITH DIODE ARRAY DETECTOR (DAD)**

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## **ABSTRACT**

### **DETERMINATION OF HYDROQUINONE IN SKIN WHITENING PRODUCTS BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY (HPLC) EQUIPPED WITH DIODE ARRAY DETECTOR (DAD)**

Skin whitening products are being used widely, especially by women. However, not many people are aware that some of the ingredients used in skin whitening products were dangerous such as hydroquinone. Hydroquinone can cause skin irritation, redness and itching. A reverse phase - high performance liquid chromatography (HPLC) method was proposed here to detect the presence and determine the amount of hydroquinone in three different brands of skin whitening products which were labeled as X, Y and Z. A composition of methanol and water (65:55) with a flow rate 1.5 mL/min was used in this study. The results showed that hydroquinone was not detected in the samples X and Y under the condition used in this study. However, sample Z contained 0.14 ppm or 0.00698% of hydroquinone. The percent relative standard deviation (% RSD) of the sample Z was 14.86%. The detected amount of hydroquinone in sample Z was below the allowable limit, 20 ppm.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of Study and Problem Statement

There are various types of skin whitening agents such as hydroquinone, arbutin, kojic acid, licorice and vitamin C that are used in the skin whitening formulation (Deconinck *et al.*, 2014). Among these, hydroquinone is commonly used due to its effectiveness as whitening agent.

For 50 years, hydroquinone has been used as one of the most effective whitening agents in cosmetics. In addition, hydroquinone is also inexpensive and easily available. However, hydroquinone has been labeled as one of the hazardous chemical compounds and the use of hydroquinone has been banned in some countries. Despite its hazardous effectiveness, hydroquinone is still illegally added to cosmetics by some irresponsible cosmetic manufacturer.

However, not many people are aware that some of the ingredients uses in skin whitening products are dangerous such as hydroquinone. Regular use of hydroquinone can cause skin irritation, redness and itching, especially for those who have sensitive skin or allergies. For these reasons, United States Food and Drug Administration (2009) have stated that some countries such as European and Japan have banned the cosmetics that contain hydroquinone.