# UNIVERSITI TEKNOLOGI MARA

# BLACK PIGMENT FORMULATION IN DYE APPLICATION

**AMIN FAISAL BIN AHMAD SANUSI**

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# INTRODUCTION

## 1. INTRODUCTION

### Research Background

Black pigment is already been produced in many kind of industry. For the production of black pigment is mainly from the carbon black that black is composed of fine particles consisting mainly of carbon. Various features of carbon black are controlled in production by partially combusting oil or gases. In order to get the glossy look in the dye application, stainless steel flake will be chosen due to its less reactivity compared to other metallic or glossy pigment.

Through a complex mixture of the carbon, surface energy and particle physics, the utility and value of carbon black is determined. The most important properties include the surface area, primary particle size, complexity of the composition, stability towards surroundings, dispersion and the binders chemistries used.

Pigments also produce other effects that may be exploited. Depending on the pigment volume concentration, the gloss may vary from matt to glossy. However, the pigment volume concentration also decides the rheological properties of the paint or plastic, which will have a profound effect on the application or processing characteristics. It is not surprising, therefore, that desirable product properties often conflict with acceptable raw material characteristics. It is often necessary to use blends of pigments, treated pigments or pigments having a certain size distribution, not to mention the use of additives or other auxiliary materials.

With the advent, many new types of carbon black namely, the furnace blacks, had to be developed. They quickly displaced most of the channel black grades for both technical

and environmental reasons. Even though many channel blacks have disappeared, there are today still more than a dozen grades of carbon black from which the coatings, ink and plastic manufacturer must choose the most suitable ones for his systems.

### 1.2 Problem Statement

Carbon black had been produced by using chemical substances (possibly carcinogenic) such as petroleum products and to overcome the problem I decided to produce new formulation of the carbon black from natural resources, bamboo (Bambusoideae) stem as the main materials for black pigment in this process.

Then, the black pigment with glitter effects have not been produced widely in the dye application in calligraphy. Thus, I would like to introduce the stainless steel flakes (glitter) into the colouring in order to have the glitter effects.

### 1.3 Objectives

In views of the problem statement stated above, the general objective of this research is to determine the black pigment formulation and its stability in the dye application with glitter effects. The other supporting objectives that are required in this research are:

1. To formulate the black pigment with less to nature effects.