UNIVERSITI TEKNOLOGI MARA

THE ACTIVATED CARBON AS ANTI-ODOUR COATED AND PIGMENT PRINTED FABRIC

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

In principle, textiles with anti-odour finishes are able to improve fabric quality by eliminating unpleasant odour making the wearers become more comfortable and confident with themselves. The present odour absorbers such as silver are very expensive. Therefore, the use of an alternative odour absorber like activated carbon is more affordable. In this study, activated carbon produced from coconut (CSAC) and oil palm shells (OPSAC) were applied in different percentages (5%, 10% and 15%) on polyester and cotton fabrics through coating and pigment printing techniques. The pigment printing was combine design and odour absorber on same piece of fabric. The coating technique was used as comparison for the effectiveness of odour absorber. These techniques are economic because using cheaper odour absorber i.e. activated carbon compared with commercial odour absorber i.e. Silver. Two types of odour measurements were conducted to evaluate the effectiveness of the anti-odour activated carbon which was through the Human Olfactory Tests and Machine Olfactory Tests using a device called Portable Electronic Nose 3 (PEN 3). Prior to the tests, the treated and control fabric samples were exposed to onion odour as substitution to body odour. The results showed that fabrics containing activated carbon were able to reduce odour that was picked up by the fabrics. The coated activated carbon fabrics gave better result than the printed activated carbon fabrics. The higher the concentration of activated carbons on the fabrics, the lower it generates odour intensity and odour annoyance, which also lower the odour of onion on the fabrics.

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May Allah bless us.

CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND

The improvement in living standard changes the consumers' attitude to become more demanding in terms of comfort and functionality properties of their clothing. Finishes with functional properties such as anti-odour, anti-microbial and wrinkle free are mediums used to counter the problems facing by every day consumers. Organic chemists (Ivan, 2009) have been collecting and studying the olfactory essence of humanity for years and concluded that the different body parts such as underarms breathe, skin and genitals produce different smell or odour. In humid weather country such as Malaysia, the high rate of perspiration can generate unpleasant body odour caused by sweat, which is usually transferred to the clothes that they wear.

Thus, clothes with anti-odour finishes can minimise unpleasant smell. Fibres with large specific surface areas with both hydrophobic and hydrophilic properties are capable of adsorbing the molecules responsible for odour, and therefore, suitable to be used as deodorizing materials (Yasuko et al., 2010). Various deodorizing substances such as enzymes, activated carbon (AC), zeolites and metals may be incorporated into fibres, which are widely used for clothing, bedclothes, interior goods and so on (Yasuko et al., 2010).

Anti-odour fabric is one of the important functional fabrics for consumers comfort. Previous studies showed that several methods were used to impart anti-odour properties on fabrics. The fabrics treated using β-cyclodextrin could have effective performance of anti-odour (Zimin et al., 2012). Fabric made of bamboo and the chemical treatment such as silver-based nanotechnology and microencapsulation, are of step forward in the textile field to combat against moulds, fungi and bacteria which can generate odour (Manojkumar, n.d.). Besides that, many chemical compounds have been used to eliminate odour or inhibit bacterial activity on textile material (Chen et al., 2010).

The present research objective is to reduce or eliminate the unpleasant odour from the clothing for the wearer to feel comfortable for longer period of time by