

**UNIVERSITI TEKNOLOGI MARA**

**MODIFICATION OF KAPOK FIBERS VIA  
ESTERIFICATION FOR POME TREATMENT**

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## **ABSTRACT**

The purpose of this study is to modified kapok fibers by esterification. The esterified kapok fibers were then test for POME treatment. Kapok fiber is one of natural fibers that have good hydrophobicity and buoyancy and is suitable for POME treatment specifically in term of oil adsorption. However due to a few weaknesses, kapok fibers need to be modified. Based on the literature search, esterification of natural fibers can increase its ability to adsorb oil. Thus, in this research, the kapok fibers were esterified and oil removal test was conducted in order to see the effect of esterification of kapok fibers on its effectiveness to reduce the oil from POME.

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## **CHAPTER 1**

### **INTRODUCTION**

Palm oil industry has been an important industry of agricultural sector in the world. Indonesia followed by Malaysia are two leading country of palm oil industry. This industry gives big impact in Malaysia's economy growth. Currently, the palm oil tree occupies largest portion of farmer land in Malaysia (Arif et. al., 2011). Palm oil tree planted area in 2014 is 5.39 million hectares and increase by 4.6 percent to 5.64 million hectares in 2015 (MPOB, 2016). However, palm oil industry also gives a big environmental impact because of its huge waste generation. Empty fruit bunches (EFB), palm oil mill effluents (POME), mesocarp fibers and shells are types of waste generated by palm oil mills. Among all wastes generated by palm oil mills, POME can be classifying as most hazardous waste.

POME is highly contaminant. It contains very high BOD, COD, TSS, oil and grease. It can be most significant water pollution if not treated well. There are many researches had been done to treat POME. However, the research conducted did not overcome this problem. This research is conducted to find a better and cheaper way to treat POME by oil adsorption. In this research, the kapok fiber is used as oil adsorption medium of POME. In order to increase its hydrophobicity, kapok fibers need to be