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Chemically Modified Sago Waste for Oil Absorption

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ABSTRACT

Oil pollution remains a serious concern especially in Malaysia. Many strategies have been employed to overcome oil pollution. In this research, sago waste material abundantly found in Sarawak was used and chemically modified into an oil adsorbent . Sago waste cellulosic residues were modified using fatty acid derivatives. The capability of the chemically modified sago waste to absorb oil from aqueous solution was studied and compared with the untreated sago waste. The modified sago waste showed higher hydrophobicity than the untreated sago waste, implying that it is less affinity for water and also an excellent affinity for oil. This chemically modified sago waste would be the most suitable for applications where engine oil (i.e., Shell Helix HX5) is to be removed from an aqueous environment. The modified sago waste selectively absorbs the oil and remains on the surface and is to be removed when the application is complete.

Keywords: Ester linkage, hydrophobic, modified sago waste, stearic acid.

INTRODUCTION

Sago, which is scientifically known as *Metroxylon sagu,* comes from genus metroxylon and family palmae (Singhal *et al.,* 2008). Sago palm is commonly found in tropical lowland forests and freshwater swamps. The areas under sago cultivation in wild and semi-wild conditions are estimated to be at 19,720 hectares, with a total planted area of 28,000 hectares. Sarawak is currently one of the world's largest exporters of sago products with annual exports of approximately 43,000 tons. The mass production of sago produces residues during processing. It was estimated that from 600 logs of sago palm per day, 15.6 tons of woody bark, 237.6 tons of waste water, and 7.1 tons of starch fibrous sago pith residue are generated (Bujang & Ahmad, 1999). Sago pith residue is composed mainly of 41.7 - 65% starch and 14.8% fibre, including a fair amount of mineral (Wina *et*

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