

**PRODUCTION OF SORBENT CARBON  
FROM OIL PALM SHELL (ENDOCARP)  
FOR SOME MEDICINAL APPLICATIONS**

**PhD (DISSERTATION)**

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**ABSTRACT**

Activated oil palm shell carbon has been prepared and characterized to be used as a probable antidote. Oil palm shell was carbonized and then activated by using microwave oven, which generates a wattage of 160 watt and 20% out put of microwave energy. Carbonization was achieved in a fabricated, electric reactor at  $540 \pm 5^\circ\text{C}$  in a time period of 120 min. The yield obtained was about  $33 \pm 1\%$ . The characteristics of the oil palm shell carbon and its proximate analyses were, moisture content 6.38%, volatile matter 18.78%, fixed carbon 61.65% and ash 13.19%. The microscopic pyrolysis of oil palm shell which was followed by TG-DTA analysis, showed approximately the carbonization temperature to be about  $531^\circ\text{C}$ . Activation with microwave energy was carried out at time periods of 15 min, 30 min, 45 min, 60 min using 160 watt with 20% output. Microwave activation was also subjected to sulphurous acid treated oil palm shell carbon. All the microwave activated carbon showed a fixed carbon of about 81-82%. The elemental distribution of the activated carbon were qualitatively determined by EDXRF. XRD indicate amorphous nature for all oil palm shell microwave activated carbon and semicrystalline structure of the commercial activated carbon. Morphology and surface features of the activated carbons were revealed to be porous and cavitated indicating foam-like amorphous state. The microwave activated carbon conformed the Langmuir and Freundlich isotherms, i.e., sorption properties with regard to phenol sorptions, iodine removal together with methylene blue and rhodamine B. Compared to other activated carbons and also to the commercial activated carbon, the 60 min microwave activated carbon together with the sulphurous acid treated activated carbon showed a somewhat significant antibacterial potency, which were based on colony counting i.e. on the basis of relative scale, where nearly half of the colony were reduced. Thus, because of its antibacterial properties and high sorptive properties for phenol, it has the potency to apply as an antidote in some applications.

**Key words -** microwave activated oil palm shell carbon, sorptive properties, colony counting, antibacterial potency, antidote.