

## **Effect of reaction time and temperature on the properties of carbon black made from palm kernel and coconut shell**

### **ABSTRACT**

**Objective:** Lignocellulosic biomass derived carbon black was thermally produced from Coconut Shell (CS) and Palm Kernel Shell (PKS). The effects of carbonization conditions on the characteristics of the produced lignocellulosic derived carbon black were studied. **Methodology:** Carbonization was carried out between 400 and 700EC for reaction ranging between 30 and 90 min. Practically, the carbonization temperature has a more prominent impact than the carbonization reaction time used in this experiment. **Results:** The result showed that high temperature carbonized carbon black had higher iodine adsorption as compared to carbon black that derived from low temperature. Prolong the reaction time resulting in structural deformation, hence less surface area for adsorption. In addition, the characteristics of carbon black from CS was fairly better than PKS carbon black in terms of iodine adsorption, surface area and fixed carbon content. The carbon black derived from PKS had lower iodine adsorption due to the poor development of porosity that contained higher ash and volatile matters. **Conclusion:** These study serves as fundamental tool to establish ideal production routes for carbon black manufactured from lignocellulosic biomass especially in the form of nut or seed shell.

**Keyword:** Palm kernel shell; Coconut shell; Carbon black; Carbonization temperature; Carbonization reaction time