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Characterization of Zinc Oxide on Green Carbon Nanotube Cotton

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Abstract. Recycling waste cooking palm oil (WCPO) as a source for alternative fuel such as biodiesel and valuable carbon materials such as carbon nanotubes (CNT) is a way to exploit it from waste to wealth. Carbon nanotubes cotton (CNTC) is one of the carbon nanostructures synthesized in high-temperature furnace. It resembles cotton candy, composed of low spatial density, ultra-long individual CNT, hydrophobic, oleophilic and exhibits good electrical and mechanical properties. CNTC from WCPO was synthesized using in-house chemical vapor deposition reactor. Ferrocene was used as catalyst with thiophene as a growth rate enhancer. The synthesis was carried out at temperature ranging from 1000 °C to 1200°C. The electrodeposition of ZnO was performed in a three electrode electrochemical cell with CNTC as the cathode. The result obtained showed that ZnO was successfully deposited on CNTC. The combination of ZnO and CNTC hybrid is a promising composite that can be further explored in the application of piezoelectric nanogenerator, sensors and high-performance electromagnetic absorbing material.

Keywords: cnt cotton, waste cooking palm oil, zinc oxide