

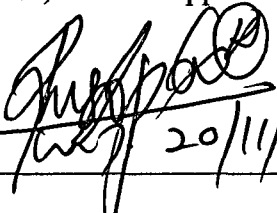
**RAMAN SPECTROSCOPY STUDY OF CARBON NANOTUBES PREPARED ON
NANO-STRUCTURED TITANIUM DIOXIDE THIN FILMS**

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**Final Year Project Report Submitted in
Partial Fulfilment of the Requirements
For the Degree of Bachelor of Science (Hons.) Physics
in the Faculty of Applied Sciences
Universiti Teknologi MARA**

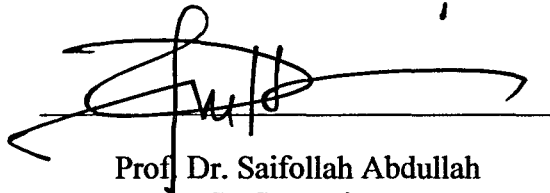
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This Final Year Project Report entitled "Raman Spectroscopy Study of Carbon Nanotubes Prepared On Nano-structured Titanium Dioxide Thin Film" was submitted by Nursheela Hashim, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences, and was approved by

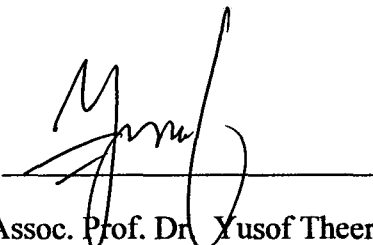


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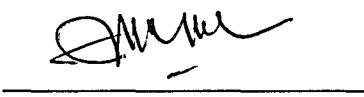
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ABSTRACT

RAMAN SPECTROSCOPY STUDY OF CARBON NANOTUBES PREPARED ON NANO-STRUCTURED TITANIUM DIOXIDE THIN FILMS

Carbon nanotubes were prepared by thermal chemical vapor deposition (TCVD) method using TiO_2 as a catalyst and palm oil as a precursor. TiO_2 solution was prepared by using sol-gel method and then spin coating technique was used to deposit TiO_2 solution onto Silicon substrate. The synthesis temperatures were varied with various temperatures; (600-850 $^{\circ}\text{C}$). The carbon nanotubes sample was characterized by using Raman Spectroscopy and Field Emission Scanning Electron Microscope (FESEM). The result show that the CNTs were grows at 750 $^{\circ}\text{C}$ in bamboo like CNTs structure. Minimal amount of CNTs were detected at 800 $^{\circ}\text{C}$ sample. There are no CNTs were noticed at temperature lower than 750 $^{\circ}\text{C}$. At higher temperature, higher than 800 $^{\circ}\text{C}$ a-c carbon were found. The Raman shift of D and G band are between 1325 cm^{-1} and 1630 cm^{-1} . Meanwhile the I_D/I_G at 750 $^{\circ}\text{C}$ is 1.13 and 800 $^{\circ}\text{C}$ is 1.06. The intensity ratio was increases when temperature decreasing. As a conclusion, CNTs grow at temperature of 750 $^{\circ}\text{C}$ and 800 $^{\circ}\text{C}$.

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