PREPARATION AND OPTIMIZATION OF CARBON NANOTUBES (CNTs) USING SILVER NANOPARTICLE CATALYST
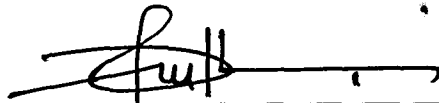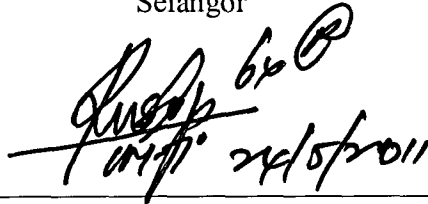
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**Final Year Project Report Submitted in Partial Fulfillment of the Requirements for
the Degree of Bachelor of Science (Hons.)
Physics in the Faculty of Applied Sciences
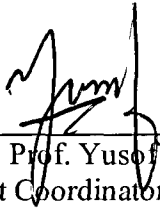Universiti Teknologi MARA Malaysia**

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ABSTRACT

PREPARATION AND OPTIMIZATION OF CARBON NANOTUBES (CNTs) USING NANOSILVER PARTICLE CATALYST

Carbon nanotubes (CNTs) is prepared by chemical vapor deposition (CVD) method using camphor as the source of carbon and silver nitrate (nanosilver) as the catalyst. Meanwhile, ferrocene are used to support the nanosilver to form the carbon nanotubes. The sample are prepared by using different amount of nanosilver as the catalyst but the amount of camphor powder, ferrocene, gas carrier flow rate, deposition time and others are fixed during the experiment. The nanosilver was varied by 0.5 ml difference for each sample. The optimum reaction temperature in this research are 800 °C. After the deposition time about 1 hour, the system are left to cooling down to room temperature. The sample then characterized by using Field Emission Scanning Electron Microscopy (FESEM) and Thermogravimetric Analysis (TGA). The FESEM are used to determine the surface morphology of the carbon nanotubes formed. Meanwhile, TGA are used to study the changes in mass of a sample as the temperature is varied. From this research, the optimum amount of nanosilver that give the high quality of carbon nanotubes is 1.0 ml of nanosilver which yield the CNTs that has the diameter of 0.056 μm, 0.058 μm and 0.059 μm. From TGA result, when using 1.0 ml silver nitrate the weight loss is greater (3.5 %) compared to the sample that use other quantity of silver nitrate. The greater the weight loss, the greater the purity of CNTs formed.