

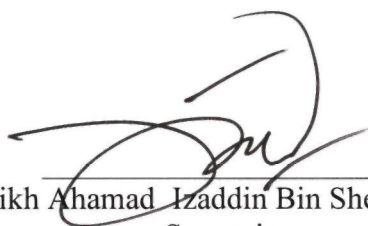
**SYNTHESIS AND CHARACTERIZATION OF GRAPHITE OXIDE  
AND 2-METHYL-4-CHLOROPHENOXY ACETIC ACID-  
GRAPHITE OXIDE (MCPA-GO) NANOCOMPOSITE WITH ITS  
CONTROLLED RELEASE PROPERTY**

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

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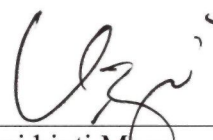
This Final Year Project entitled “**Synthesis and Characterization of Graphite Oxide and 2-Methyl-4-Chlorophenoxy Acetic Acid-Graphite Oxide (MCPA-GO) Nanocomposite with its Controlled Release Property**” was submitted by Norilyani Izzati Binti Hasanuddin, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry, in the Faculty of Applied Sciences, and was approved by



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## ABSTRACT

### SYNTHESIS AND CHARACTERIZATION OF GRAPHITE OXIDE AND 2-METHYL-4-CHLOROPHENOXY ACETIC ACID – GRAPHITE OXIDE (MCPA-GO) NANOCOMPOSITE WITH ITS CONTROLLED RELEASE PROPERTY

The graphite oxide and 2-methyl-4chlorophenoxy acetic acid– graphite oxide (MCPA-GO) nanocomposite were successfully synthesized by using improved Hummer's method and ion-exchange method respectively. In this study, MCPA-GO nanocomposite was synthesized at various concentration of MCPA ranging from 0.1 to 0.7 M to lowering its toxicity and increase the drugs/herbicides loading efficiency. Meanwhile, the graphite oxide was prepared with the use the graphite powder as starting material. Graphite oxide and MCPA-GO nanocomposite were characterized using Fourier transform infrared (FTIR) spectroscopy, powder X-ray diffraction (PXRD) and Carbon Hydrogen Nitrogen and Sulphur analyzer (CHNS). The FTIR spectra of MCPA-GO nanocomposite was showed resemblance peaks of the MCPA and graphite oxide indicated the inclusion of MCPA into the graphite oxide. As for XRD pattern, there was increasing in the basal spacing of the nanocomposite from the graphite oxide which by 9.3 Å to 9.7 Å. Other than that, the percentage loading of MCPA in the nanocomposite was calculated to be 98.0 % (w/w) based on the CHNS result. Next, the controlled release of MCPA-GO nanocomposite was done in two different solution which were in sodium chloride solution (NaCl) and sodium carbonate solution (Na<sub>2</sub>CO<sub>3</sub>). The release of MCPA into these solution was found to be dependent to the anion in the order of Na<sub>2</sub>CO<sub>3</sub> > NaCl with the percentage release of 66 % and 10 % respectively. It proved that this release property exhibits the potential application of graphite oxide as effective nanocarrier of herbicides.