

**SYNTHESIS, CHARACTERIZATION AND ANTI-CORROSION  
SCREENING OF *N,N*-BIS (4-CHLOROBENZALDEHYDE)-*o*-  
PHENYLENEDIAMINE AND NICKEL(II) COMPLEX**

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This Final Year Project Report entitled “**Synthesis, Characterization and Anti-Corrosion Screening of *N,N*-Bis (4-Chlorobenzaldehyde)-o-Phenylenediamine and Nickel(II) Complex**” was submitted by Intan Sapura Abdul Halim, in partial fulfilment 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, CHARACTERIZATION AND ANTI-CORROSION SCREENING OF *N,N*-BIS (4-CHLOROBENZALDEHYDE)-*o*-PHENYLENEDIAMINE AND NICKEL(II) COMPLEX

The desired compound which are *N,N*-Bis(4-chlorobenzaldehyde)-*o*-phenylenediamine, (4ClOPD) and Ni(II) complex (Ni4ClOPD) were successfully synthesized from the condensation reaction of 4-chlorobenzaldehyde and *o*-phenylenediamine which undergo further insertion with Ni(II) metal center to produce a complex. The compounds were characterized by analytical and spectral techniques such as elemental analysis, FT-IR and UV-Vis Spectroscopy, melting point and molar conductivity measurement. The FT-IR analysis reveal the coordination of ion metal center with ligand through azomethine to nitrogen form the metal complex. The UV-Vis analysis indicates the presence of  $n \rightarrow \pi^*$  and  $\pi \rightarrow \pi^*$  transitions which were assign for 4ClOPD and complex, Ni4ClOPD. The transition for the  $n \rightarrow \pi^*$  is shifted from 295 nm to 267 nm in the complex meanwhile for the transition  $\pi \rightarrow \pi^*$ , the complex is shifted from 214 nm to 212 nm. UV-Vis spectral for the Ni4ClOPD showed the presence ligand to metal charge transfer (LMCT) at 375 nm were detected in the spectrum of the complex. The molar conductivity values show that the Ni(II) complex was non electrolyte. The anti-corrosion activity of the ligand, 4ClOPD and its complex, Ni4ClOPD were studied on mild steel at 50<sup>0</sup>C for 48 hours immersion time and it was found that the inhibition efficiency were increased as the inhibitor concentration increase. The corrosion inhibition study also shows that both of the ligand, 4ClOPD and the complex, Ni4ClOPD are a good corrosion inhibition and Ni4ClOPD shows the highest corrosion inhibition with the inhibition efficiency at 86.00%.