

**SYNTHESIS, CHARACTERISATION AND ANTI-CORROSION
SCREENING OF Ni(II) *N*-BUTYLMETHYL DITHIOCARBAMATE
AND Ni(II) *N*-ETHYLBENZYL DITHIOCARBAMATE**

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ABSTRACT

SYNTHESIS, CHARACTERISATION AND ANTI-CORROSION SCREENING OF Ni(II) *N*-BUTYLMETHYL DITHIOCARBAMATE AND Ni(II) *N*-ETHYLBENZYL DITHIOCARBAMATE

Two dithiocarbamates complexes which are Ni(II) *N*-butylmethyl dithiocarbamate, Ni[BuMedtc]₂ and Ni(II) *N*-ethylbenzyl dithiocarbamate Ni[EtBenzdtc]₂ were successfully synthesised using *in situ* method. Both complexes were characterised by FT-IR and UV-Vis spectroscopy, gravimetric analysis, molar conductivity, melting point and X-ray Crystallographic analysis. From IR spectroscopy, the important stretching bands which are $\nu(\text{C}\equiv\text{N})$ and $\nu(\text{C}\equiv\text{S})$ were appeared in the range of 1508-1518 cm⁻¹ and 948-967 cm⁻¹ respectively. The absence of $\nu(\text{N-H})$ bands after complexation in spectra of both complexes proved that the formation of complexes have been take place. For UV-Vis spectroscopy, there are absorption peak observed in the Ni[BuMedtc]₂ and Ni[EtBenzdtc]₂ at 325 nm and 330 nm respectively. It is indicated to the $n\rightarrow\pi^*$ transitions. At more than 400 nm, there was absorption peak appeared which is indicated to the $d-d$ transitions of Ni(II) complexes. The melting points of both complexes were higher than 300 °C. The molar conductivity showed that Ni[BuMedtc]₂ and Ni[EtBenzdtc]₂ were non-electrolyte. The gravimetric analysis showed the percentage of Ni(II) in Ni[BuMedtc]₂ was 7.5% meanwhile in Ni[EtBenzdtc]₂ was 5.98%. For X-ray crystallographic analysis, only Ni[BuMedtc]₂ that was successfully produced single crystal that suitable for this analysis. The results obtained showed that Ni[BuMedtc]₂ is four-coordination tetrahedral geometry and adopted to hexagonal system with the crystal parameter: $a = 25.544(10) \text{ \AA}$, $b = 25.544(10) \text{ \AA}$, $c = 7.018(5) \text{ \AA}$, $\alpha = 90^\circ$, $\beta = 90^\circ$, $\delta = 120^\circ$ and $Z = 9$. The corrosion inhibition study showed that C2 has higher corrosion inhibitor efficiency than Ni[BuMedtc]₂. From this study also showed that the inhibitor efficiency increased as the concentration of inhibitor increased.