

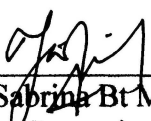
**THE INHIBITORY EFFECT OF METHYLENE BLUE DYE ON
SOME METALS IN HYDROCHLORIC ACID SOLUTION**


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ABSTRACT

THE INHIBITORY EFFECT OF METHYLENE BLUE DYE ON SOME METALS IN HYDROCHLORIC ACID SOLUTION

The inhibitory effect of methylene blue (MB^+) dye on aluminum and mild steel metal in hydrochloric acid solution were ascertained. The effect of methylene blue dye concentration on corrosion inhibition, the effect of addition of halides (synergistic effect) and also the characterization of methylene blue dye as corrosion inhibitor were determined. Both the effect of concentration and addition of halides were determined using the gravimetric method. A series of different concentration of methylene blue were prepared to obtain the optimum concentration that would give the best inhibition efficiency is determined. Meanwhile for the characterization, the Fourier transform infrared (FTIR) spectroscopy is used. The inhibition efficiency is observed to be increased when the concentration increases. The highest inhibition efficiency for aluminum and mild steel is 54.81% and 58.18% respectively at optimum concentration 0.005 M. After the addition of halides, the inhibition efficiency of increases from 14.29% to 28.57% and 38.09% for Cl^- and I^- respectively for aluminum. The inhibition efficiency for mild steel increases from 22.48% to 24.99% and 28.26% for Cl^- and I^- respectively. Thus, it can be concluded that iodide ion have greater ability to enhanced corrosion inhibition than chloride ion. Characterization using FT-IR managed to show that methylene blue do contained heteroatom such as nitrogen that can form polar covalent bond and act as the reactive centre in the molecule. It is also can be seen on the spectrum that methylene blue do contain heterocyclic compound based on the $\text{C}=\text{C}$ ring stretch and also have $\text{C}-\text{N}$ bond. This bond confirmed the existence of heterocyclic compound which is an aromatic ring that bonded to element other that C and also provide evidence that methylene blue is suitable to be a corrosion inhibitor.