

***PREPARATION AND EVALUATION OF THE
EFFICIENCY OF SOME AMINO MELAMINE
RESINS AS CORROSION INHIBITORS FOR
CARBON STEEL IN ACIDIC MEDIUM***

A thesis Submitted

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BY

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Summary

This study is concern with the synthesis, characterization and evaluation of two new anti corrosion inhibitors based on melamine derivatives. This include [derivative of Diethanol Amine Melamine Chloral IV] and [derivative of Diethanol Amine Melamine Formaldehyde III].

The two resins were prepared from condensation reaction of Diethanol Amine with Melamine Chloral and Melamine Formaldehyde resins at optimum experimental conditions which were obtained from running many experiments including several parameter affect such as temperature, catalyst, and the equivalent ratio ... etc.

The prepared resins were characterized by the available techniques i.e. I.R and u.v-visible spectrophotometry. The prepared resins III and IV were evaluated as corrosion inhibitors for Carbon steel (N-80) in acidic medium. The effect of pH., Temperature Degree, inhibitor concentration and exposure time on corrosion rate were studied.

Three methods were used for the evaluation of corrosion inhibitor. There are:-

1. Electrochemical method which is using extrapolation of steady state polarization curves and determining Tafle curves at different experimental conditions.
2. Weight loss method which is familiar in the evaluation of corrosion inhibitor.
3. Polarized microscope test.

The result obtained using methods 1 at temperature range (303-323) k^o and 2 at temperature range (303-333) k^o, for determining many functional limiting inhibitor efficiency such as corrosion rate, inhibitor efficiency , it has been noticed that the corrosion rate increases with increasing of temperature and it decreases with increasing of two inhibitors concentration at fixed temperature. The results revealed that both inhibitors had high efficiency in decreases corrosion rate which reached to (86.54%) by using inhibitor (III) at method 1, and it was (97.366%) at method 2. While, the efficiency was (90.19%) by using inhibitor (IV) at method 1. Many thermal dynamic functions, activation energy E_a , enthalpy ΔH and entropy ΔS were calculated.

Adsorption characteristic of the two inhibitors were calculated i.e. adsorption area at different experimental conditions. These were considered as an important functions for inhibitor evaluation. Also the Metallurgical Microscope Tests improved that both inhibitors had high efficiency on adsorption on Carbon steel. The result obtained using the three techniques that the two inhibitor III and IV shows high efficiency in decreasing corrosion rate in acidic medium which can be used in industry.