Summary and Conclusion

1- The introduction included a literature survey of the different theories of corrosion and corrosion inhibition. The electrochemical behavior of carbon steel in aqueous solutions (acidic, alkaline and neutral) was given with particular emphasis on the effect of aggressive as well as inhibitive anions.

2- Potential–time curves were obtained for carbon steel electrode in different percentages of NaCl. It is found that, the steady state potential is shifted to more negative values with increasing NaCl concentrations.

3- Addition of inorganic compounds such as sodium salts of molybdate, tungestate, vanadate and organic compounds such as Neville-Winter azo dyes derivatives on the potential–time curves of carbon steel electrode in 3.5% NaCl. It is found that the steady state potential is shifted to more positive values with increasing the above additives.

4- The anodic and cathodic Tafel lines were constructed for carbon steel in deaerated NaCl solution. Increase of NaCl concentration was accompanied by:
   (i) Change of anodic and cathodic Tafel slopes.
   (ii) The corrosion potential is shifted to more negative values.
   (iii) The corrosion current density increases.

5- Addition of some inorganic and organic compounds mentioned above affected the kinetic parameters of the dissolution of carbon steel in

3.5 % NaCl solution. It is clear that, as the concentration of additives increases:

(i) The corrosion potential is shifted to more positive values.

(ii) The corrosion current density decreases and consequently, the inhibition efficiency increases. The above values of $E_{corr.}$ and $I_{corr.}$ indicated the inhibiting effect of such compounds.

6- Adsorption of the above additives obeys Freundlich adsorption isotherm.

7- Potentiodynamic anodic polarization curves of carbon steel in different concentrations of NaCl solution was studied. It was found that the Cl^- ions cause the destruction of the passivating oxide film and initiate pitting corrosion. The pitting corrosion potential is shifted to more negative values with increasing chloride ions concentration.

8- Trials were made to inhibit pitting corrosion using inorganic compounds such as (Na_2MoO_4, Na_2WO_4, Na_2VO_3). These compounds shifted the pitting potential to more positive values, indicating the inhibiting effect of these compounds.