SUMMARY

The present thesis is divided into seven chapters. The first chapter gives a brief discussion of principles of corrosion, theories of corrosion inhibitors, polarization methods and their importance in corrosion investigations and methods of studying corrosion.

Chapter II is devoted to corrosion of 63/37 brass in hydrochloric acid and its inhibition. Section I gives a brief summary of corrosion characteristics of brass. Section II gives a resume of reported work on corrosion of brass in hydrochloric acid solution, whereas III section gives a review of reported corrosion inhibitors for brass. Section IV reports results of experimental results of eight substances and corrosion inhibitors for 63/37 brass in hydrochloric acid and section V gives a comparison of the performance of these inhibitors 70/30, 63/37 and 60/40 brass.

The III chapter is concerned with corrosion of zinc in hydrochloric acid and its inhibition. The I section gives a brief discussion of corrosion characteristics of zinc. Section II gives a review of corrosion of zinc in hydrochloric acid and III section gives a report on corrosion inhibitors for zinc in hydrochloric acid. The IV section reports results on experimental investigation.
on nine monoamines as corrosion inhibitors for zinc in hydrochloric acid. In the V section an attempt is made to correlate the structure of amines with their inhibitive action. Section VI reports the influence of temperature on the performance of inhibitors.

The V chapter is about the corrosion of zinc in sulfuric acid and its inhibition. The I section gives a review of the corrosion of zinc in sulfuric acid and the II section gives a summary of reported inhibitors for the corrosion of zinc in sulfuric acid. The III section gives results of five aldehydes as corrosion inhibitors for zinc in sulfuric acid.

The V chapter deals with combined cathodic protection of metals. The I section gives a brief discussion of cathodic protection of metals. The II section reports the results of combined cathodic protection of zinc in hydrochloric acid by nine monoamines, whereas the III section reports combined cathodic protection of zinc in sulfuric acid by five aldehydes.

The VI chapter deals with influence of impressed anodic current on performance of inhibitors. The difference effect is positive in the presence and absence
of inhibitors.

Chapter VII gives a comparison of the behaviour of monoamines towards zinc metal and aluminium alloys in hydrochloric acid.
Structural formulae of inhibitors for the corrosion of 63/37 brass in hydrochloric acid
Structural formulae of inhibitors for the corrosion of zinc in hydrochloric acid

(1) Methyl amine
\[ \text{CH}_3\text{NH}_2 \]

(2) Dimethyl amine
\[ \text{CH}_3\text{NH} - \text{CH}_3 \]

(3) Tri-methylamine
\[
\begin{align*}
\text{CH}_3 \\
\text{CH}_3 - \text{N} - \text{CH}_3
\end{align*}
\]

(4) Ethyl amine
\[ \text{C}_2\text{H}_5\text{NH}_2 \]

(5) Diethyl amine
\[ \text{C}_2\text{H}_5 - \text{NH} - \text{C}_2\text{H}_5 \]

(6) Tri-ethyl amine
\[
\begin{align*}
\text{C}_2\text{H}_5 \\
\text{C}_2\text{H}_5 - \text{N} - \text{C}_2\text{H}_5
\end{align*}
\]

(7) Ethanol amine
\[ \text{NH}_2\cdot\text{C}_2\text{H}_4\cdot\text{OH} \]

(8) Di-ethanol amine
\[ \text{HOH}_4\text{C}_2 - \text{NH} - \text{C}_2\text{H}_4\cdot\text{OH} \]

(9) Tri-ethanol amine
\[
\begin{align*}
\text{C}_2\text{H}_4\text{OH} \\
\text{N} - \text{C}_2\text{H}_4\text{OH} \\
\text{C}_2\text{H}_4\text{OH}
\end{align*}
\]
Structural formulae of inhibitors for the corrosion of zinc in sulfuric acid