

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusions

- The oxide films on the steels in high temperature water contain a double layer structure, i.e., an inner layer enriched in Cr and an outer layer enriched in Fe.
- Steel with higher Cr content has a smaller particle size and higher packing density than the steels with a lower Cr content.
- The oxide film on A106B is determined to be Fe_3O_4 while, the microstructure of oxide film formed on Fe-Cr alloys is predominant by spinel structure $(\text{Ni}_x\text{Fe}_{1-x})(\text{Fe}_{2-y}\text{Cr}_y)\text{O}_4$ with non-stoichiometric composition.
- The characteristics of the inner oxide layer have an important affect on the corrosion resistance. The inner layer of the steels with lower Cr content contains less Cr. The Cr comes from the steel matrix.
- An enrichment of Cr in the inner layer results in a less porous in the oxide film and decreases the corrosion rate of passivated steels by controlling the diffusion of Fe.

5.2 Recommendations for the Future Work

- Characterize the oxide which is developed in stationary high temperature water solution in order to determine the effect of mass transfer.
- Perform the electrochemical characterization including the analysis of the polarization curve and impedance spectra, at high temperatures and reducing conditions.