



## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Conclusions

Precipitation kinetics of Ca-ATMP was studied and the results indicate that:

- 1) The parameters affecting the precipitation kinetics are pH, supersaturation ratio, and the type of monovalent salts (NaCl, LiCl, and KCl).
- 2) Monovalent cations decrease both the nucleation and growth rates.
- 3) The surface energies obtained in the presence of a monovalent salt are higher than that in the absence of salt in order of  $\text{LiCl} < \text{NaCl} < \text{KCl}$ .
- 4) The nucleation rate is lower in the presence of a monovalent salt than that in an absence of salt. The nucleation rate increases in order of  $\text{LiCl} > \text{NaCl} > \text{KCl}$ .
- 5) The size of Ca-ATMP precipitate in the presence of a monovalent salt is larger than that without salt.
- 6) The Ca-ATMP growth is controlled by surface reaction in both with and without salt.
- 7) The growth of Ca-ATMP is governed by spiral mechanism.

#### 5.2 Recommendations

It is important to study the conditions in the actual oilfield compound with many divalent ions and impurities, which affect precipitation kinetics of the Ca-ATMP precipitates. Further experimental studies should be carried out under these actual conditions.