CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The calcium-ATMP precipitates were synthesized at each extreme conditions by titration technique. The precipitates were then characterized their compositions by AAS and Hach technique. The precipitate morphologies were depicted by SEM. Next, the Ca-ATMP supersaturated solutions were injected into micromodel and coreflood experiments for studying the performance of precipitation and dissolution in porous medium. From the experimental results, they can be concluded as below :

1) Two parameters affected to the type of precipitates are precipitating pH and calcium/ATMP molar ratio in solution. At the high pH, the ATMP molecule have more deprotonated and occurred active phosphate groups which are effective in reacting with calcium cation.

2) The degree of supersaturation has a little effect on the type of precipitates. At a different degree of supersaturation but the resulting precipitates still have the same manner.

3) The resulting Ca-ATMP precipitates have the different dissolution which are dependent upon the conditions forming the precipitates.

4) The placement of supersaturated solution in micromodel showed the performance of precipitation and dissolution from porous media. The 1:1

precipitate seen through the stereo zoom was spherical particle similar to 2:1 and 3:1 precipitates but larger size and loosely packing. The release of 1:1 precipitate from porous media observed from the elution curve had four regions of dissolution which depended on the limit solubility level and the effect of infinitesimal size of porous media.

5) The release of 2:1 and 3:1 precipitates observed from porous media had two regions of dissolution. The particles situated in micromodel were very tiny and strongly packing. During the elution, the particles were extended into the pore bodies which were dissolved by hydrodynamic.

6) During the elution period, the 3:1 precipitate remaining in a micromodel was observed that the precipitate was developed to the crystalline forms which was less soluble than the amorphous phase (Tomson et.al.,1994). Thus, the elution curve of this precipitate showed the longest squeeze lifetime.

7) The scale treatment in the actual field is ideally needed the 3:1 precipitate because it gives the longest squeeze lifetime which is appropriate in preventing the scale from forming for a long time.

5.2 Recommendations

The conditions in the actual oilfield compound with many divalent cations which affect to form the precipitates. The temperature in reservoir is very high which it is an important factor with properties of scale inhibitors effecting on the precipitation and dissolution. To close the actual conditions and give the more exact results, the further studies should be concerned about these significant factors.