

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

1. For the experimental results, it indicates that the formation of four distinct precipitates of calcium-ATMP depended upon both the solution's pH values and the calcium/ATMP molar ratios.

2. The equilibrium solubility of each precipitate was a function of pH of the solution. The precipitate formed at high pH conditions tended to have low solubilities.

3. The 3:1 precipitate formed at the high pH condition had significantly low solubility and gave the elution curve with an extremely long tailing region.

4. The excess calcium cation adding into the dissolved solution could transform the 1:1 calcium-phosphonate precipitate to 2:1 calcium-phosphonate precipitate in the batch dissolution experiments.

5. The presence of calcium cation in the elution fluid could suppress the solubility of the 1:1 calcium-phosphonate precipitates and decreased their dissolution rates.

6. The squeeze lifetime could be enhanced by adding extra calcium cation into the elution fluid.

5.2 Recommendations

In an effort to verify the effect of calcium ion on the dissolution of precipitate, the calcium solutions at high concentration values were used.

Consider economical factor, a low concentration level of calcium solution should be examined to find an optimum value in order to minimize an operational cost. In addition, there are many different phosphonates currently used in oilfields. The other phosphonates or a mixture of two phosphonates or more should be studied for better understanding of how different precipitates can be formed and how they affect the dissolution rates of precipitates in the porous media. The results from these studies can give a flexible alternative to oil producers. Moreover, actual condition of most reservoirs is high temperature. It is an important factor that affects the properties of phosphonates and the rates of their chemical reactions. Therefore, this significant factor should be investigated.