REFERENCES

- Browning, F. H., and Fogler, H. S. (1993). Precipitaton and dissoluiton of calcium-phosphonates for the enhancement of squeeze lifetimes. <u>SPE</u> <u>25164</u> presented at the Intl. Symposium on Oilfield Chemistry, held in New Orleans, L.A, 2-5 March.
- Browning, F. H. (1996). <u>Precipitaton and dissoluiton of calcium-phosphonates for the enhancement of squeeze lifetimes</u>. Ph.D. Dissertation, Department of Chemical Engineering, The University of Michigan.
- Browning, F. H. and Fogler, H. S. (1996). Fundamental study of the dissolution of calcium phosphonates from porous media. <u>AIChE</u> <u>Journal</u>, 42, 2883-2896.
- Monsanto technical bulletin, Publication No.7459024A. Information on Dequest 2010, 2016 & 2016D, Phosphonates for scale and corrosion control, chelation, dispersion.
- Monsanto technical bulletin, Publication No.7451003A. A basic primer for diverse applications.
- Monsanto technical bulletin introductory brochure for water treatment in a wide range of applications.
- Monsanto chemical data on a method for total DEQUEST content by digestion to orthophosphate, Report No. 7256.
- Rerkpattanapipat, P. (1996). <u>Precipitation and dissolution of calcium-phosphonate on inhibition of scale formation in porous media</u>. M.S. Thesis in Petrochemical Technology, The Petroleum and Petrochemical College, Chulalongkorn University.
- Suwannamek, I. (1998). <u>Dissolution of scale inhibitor (DTPMPA) in porous</u> <u>media</u>. M.S. Thesis in Petrochemical Technology, The Petroleum and Petrochemical College, Chulalongkorn University.

- Sorbie, K.S.; Jiang, Ping; Yuan, M.D.; Chen, Ping; Jordan, M.M.; Todd, A.C., (1993). Effect of pH, calcium, and temperature on the adsorption of phosphonate inhibitor onto consolidated and crushed sandstone. SPE Annual Technical Conference and Exhibition V PI, Houston, TX, U.S.A., 949 – 964.
- Wattana, P. (1997). <u>Dissolution kinetics of scale inhibitors in the presence of high concentration of calcium</u>. M.S. Thesis in Petrochemical Technology, The Petroleum and Petrochemical College, Chulalongkorn University.

APPENDIX

Table A-1Effect of solution pH on the Ca2+/HEDP precipitate molar ratio

pH of solution	Ca ²⁺ / HEDP Molar Ratio
2	1.09
6	2.06

Table A-2Transformation of 1:1 $Ca^{2+}/HEDP$ precipitates in saturated $Ca^{2+}/HEDP$ solution pH=6.0

Time (min)	Ca ²⁺ / HEDP Molar Ratio
0	1.09
0.5	1.22
1	1.31
2	1.45
3	1.52
4	1.56
5	1.68
6	1.63
7	1.72
8	1.82
9	1.99
10	2.04
15	2.03
20	2.04
25	1.99
30	2.04

Table A-3 Transformation of 2:1 $Ca^{2+}/HEDP$ precipitates in saturated $Ca^{2+}/HEDP$ solution pH=2.0

Time (min)	Ca ²⁺ / HEDP Molar Ratio
0	2.05
1	2.05
2	1.95
3	1.94
5	1.92
10	1.86
15	1.86
20	1.84
25	1.68
30	1.68
50	1.68
180	1.46
420	1.29
720	1.09
1290	1.01
1710	1.00

48

CURRICULUM VITAE

Name :Ms. Jaruwan LiwsrisakulDate of Birth :March 1st, 1974Nationality :ThaiUniversity Education :Import 1993-19971993-1997Bachelor's Degree in Chemical Engineering
Faculty of Science, Chulalongkorn University,
Bangkok, Thailand

.