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References

- [1] M. K. Memon, M. T. Shuker, "Oil Recovery by WAG Injection Process: An Overview", UniversitiTeknologiPetronas, 2012.
- [2] S.K. Choi, M.M. Sharma, S.L. Bryant and C. Huh, "Ph-Sensitive Polymers for Novel Conformance-Control and Polymer-Flood Applications," SPE International Symposium on Oilfield Chemistry, USA, April 2010.
- [3] H.H. Al-Sharji, C.A. Grattoni, R.A. Dawe, "Disproportionate Permeability Reduction Due to Polymer Adsorption Entanglement," SPE European Formation Damage Conference, Netherlands, SPE-68972-MS, May 2001.
- [4] R. Masoud, S. Sigmund, B.A. Marit, and S. Arne, "Static and Dynamic Adsorption of Salt Tolerant Polymers," European Symposium on Improved Oil Recovery, France, April 2009.
- [5] Exerowa, D., and Kruglyakov, P. M. (1998). *Foam and Foam Films. Elsevier Science.*
- [6] Weaire, D., and Hutzler, S. (1999). *The Physics of Foams.* Oxford:Oxford University Press.
- [7] Simjoo, M., Dong, Y., Andrianov, A., Talanana, M., and Zitha, P. L. J. (2011). *Novel Insight into Foam Mobility Control.* Paper IPTC 15338 presented at the International Petroleum Technology Conference held in Bangkok, Thailand, 7-9 February 2012.
- [8] Holm, L.W. (1998). The Mechanism of Gas and Liquid Flow Through Porous Media in the Presence of Foam. *SPE Journal.* 8(4), 359-369.
- [9] Schramm, L.L., and Wassmuth, F. (1994). *Foams: Basic Principles in Foams: Fundamentals & Applications in the Petroleum Industry.* Schramm, L.L. (ed.). *American Chemical Society, Washington, D.C.*
- [10] Kovscek, A. R., and Radke, C. J. (1994). *Fundamentals of Foam Transport in Porous Media in Foams: Fundamentals and Applications in the Petroleum Industry.* Schramm, L. L. (ed.). *Advances in Chemistry Series, American Chemical Society, Washington, D.C.*
- [11] Rossen, W. R. (1996). *Foams in Enhanced Oil Recovery in Foams: Theory, Measurements and Application.* Prud'homme, R. K., and Khan, S. (eds.). New York: Marcel Dekker.
- [12] Zitha, P.L.J., Nguyen, Q. P., Currie, P. K., and Buijse, M. A. (2006). Coupling of Foam Drainage and Viscous Fingering in Porous Media Revealed by X-ray Computed Tomography. *Transport in Porous Media.* 64(3), 301-313.
- [13] Turta, A. T., and Singhal, A. K., Petroleum Recovery Institute (PRI)/Alberta Research Council (ARC) (2002). Field Foam Applications in Enhanced Oil Recovery Projects: Screening and Design Aspects. *Journal of Canadian Petroleum Technology.* 41(10).
- [14] Tunio, S. Q., and Chandio, T. A., Faculty of Geosciences and Petroleum Engineering, Universiti Teknologi PETRONAS, Malaysia (2012). Recovery Enhancement with Application of FAWAG for a Malaysian Field. *Journal of Applied Sciences, Engineering and Technique.* 4(1), 8-10.
- [15] Skauge, A., Aarra, M. G., Surhuchev, L., Martinsen, H. A., and Rasmussen, L. (2002). *Foam-assisted WAG: Experience from the Snorre Field.* Paper SPE 75157 presented at the 2002 SPE/DOE Improved Oil Recovery Symposium, Tulsa, Oklahoma, 13-17 April.
- [16] M. K. Zahoor, M. N. Derahman, and M. H. Yunan, "WAG Process Design- an Updated Review", *Brazilian Journal of Petroleum and Gas*, vol. 5, no.2, 2011.
- [17] Wassmuth, F. R., Green, K., Arnold, W., and Cameron, N., 2007. *Polymer Flood Application to Improve Heavy Oil Recovery at East Bodo.* Volume 48, No. 2, February 2009.
- [18] R.F. Mezzomo, P. Moczylower, A.N. Sanmartin, and C.H.V. Araujo, "A New Approach to the Determination of Polymer Coconcentration in Reservoir Rock Adsorption Tests," SPE 75204, Tulsa, Oklahoma, April 2002.
- [19] C.T.Q. Dang, Z. Chen, N.T.B. Nguyen, W. Bae, and T.H. Phung, "Development of Isotherm Polymer/Surfactant Adsorption Models in Chemical Flooding," SPE 147872, Jakarta, Indonesia, Sept 2011.
- [20] G. Chauveteau, and A. Zaitoun, "New Insight on Polymer Adsorption Under High Flow Rates. SPE 75183, Tulsa, Oklahoma, April 2002.
- [21] M.M. Amro, "Investigation of Polymer Adsorption on Rock Surface of High Saline Reservoir," SPE 120807, Alkhobar, Saudi Arabia, May 2008.
- [22] Farajzadeh, R., Andrianov, A., Krastev, R., Hirasaki, G. J., and Rossen, W. R. (2012). Foam-oil Interaction in Porous Media: Implications for Foam Assisted Enhanced Oil Recovery. *Advances in Colloid and Interface Science.* 183-184(2012), 1-13.
- [23] Bergeron, V., Fagan, M. E., and Radke, C. J. (1993). Generalized Entering Coefficients: A Criterion for Foam Stability Against Oil in Porous Media. *Langmuir.* 9(7), 1704-13.
- [24] Farajzadeh, R., Krastev, R., and Zitha P. L. J. (2008). Properties of Foam Films Stabilized by AOS Surfactant. *Colloids and Surfaces A: Physicochemical and Engineering Aspects.* 324 (2008), 35-40.
- [25] Turta, A. T., and Singhal, A. K., Petroleum Recovery Institute (PRI)/Alberta Research Council (ARC) (2002). Field Foam Applications in Enhanced Oil Recovery Projects: Screening and Design Aspects. *Journal of Canadian Petroleum Technology.* 41(10).
- [26] Z. Z. Abdullah, Z. M. Zain, N. A. Anua, and S. Bhd, "Application of Radioactive and Chemical Tracer for Offshore WAG Pilot Project", SPE 143391, 2011.
- [27] M. D. Jackson, M. Y. Gulamali, E. Leinov, J. H. Saunders, and J. Vinogradov, (2010). "Spontaneous Potentials in Hydrocarbon Reservoirs During Waterflooding: Application to Water-front Monitoring". SPE 135146 presented at the SPE Annual Technical Conference and Exhibition, Florence, Italy, September 20-22.
- [28] M. D. Jackson, J.H. Saunders, E. A. Addiego-Guavera, (2005). "Development and Application of New Downhole Technology to Detect Water Encroachment Toward Intelligent Wells". SPE 97063 presented at the SPE Annual Technical Conference and Exhibition, Dallas, Texas, U.S.A, October 9-12.
- [29] R. J. Hunter. (1981). "Zeta Potential in Colloid Science". Academic Press, New York, 1981.
- [30] M. Z. Jaafar, J. Vinogradov, M. D. Jackson, J. H. Saunders, C.C. Pain, (2009) "Measurement of Streaming Potential for Downhole Monitoring in Intelligent Wells". SPE 120460, presented at the SPE Middle East Oil & Gas Show and Conference, Kingdom of Bahrain, March 15-18.
- [31] W. R. Sill, (1983). "Self-Potential Modeling From Primary Flows. *Geophysics* 48 (1), 76-78.
- [32] J. H. Saunders, M. D. Jackson, and C. C. Pain, (2006). "Fluid Flow Monitoring in Oil Fields Using Downhole Measurements of Electrokinetic Potential". *Geophysics* 73,5.
- [33] S. X. Li, D. B. Pengra and P. Z., Wong (1995). "Onsager's Reciprocal Relation and the Hydraulic Permeability of Porous Media". *Physical Review* 51 (6), 5748-5751.
- [34] B. Wurmstich and F. D. Morgan, (1994). "Modeling of Streaming Potential Responses Caused by Oil Well Pumping". *Geophysics* 59, 46.
- [35] Wassmuth, F. R., Green, K., Arnold, W., and Cameron, N., 2007. *Polymer Flood Application to Improve Heavy Oil Recovery at East Bodo.* Volume 48, No. 2, February 2009.