

Surfactants Synergism for Achieving the Optimum Salinity in Low-Sal Reservoir

Ratna Widyaningsih¹⁾ · Wisup Bae^{1)*} · Sungmin Jung¹⁾ · Byungun¹⁾ · D.Shanty A Gunadi¹⁾

1. Introduction (Purpose of Study)

ASP Formulation was conducted to get the proper chemical recipe for a certain reservoir. The target in this investigation is low salinity reservoir. So the ASP formulation that made, it should gives the low optimum salinity. The wanted ASP formulation is formulation that gives the stable solution, it is characterized by no cloudiness, no phase separation and no precipitation. Using only one surfactant sometimes is not always proper with the target. So we should combine some surfactant to make synergism. Such as combining nonionic and ionic or high HLB and low HLB. Thus the optimum salinity target can be achieved by adjusted the surfactants concentration ratio.

2. Process and Methodology

The phase behavior was conducted to find the ASP formulation that can give the optimum salinity at 0.6%. The high HLB and low HLB surfactant were combined to get the target optimum salinity. Add alkali also can modify the electrolyte concentration in the aqueous phase that can lowering the optimum salinity. The used surfactants are LAS, DOSS and Ce(EO20)SO3. Some surfactant ratio are set up to observe the effect of each surfactant to increase or decrease optimum salinity.

3. Result and Conclusion

By doing the phase behavior test, adding linear alkyl benzene sulfonate gives higher optimum salinity, however the sodium dioctyl sulfosuccinate lower the optimum salinity. Ce(EO20)SO3 gives solubilization in water higher. It can be seen when anionic polymer was added, it doesn't make any precipitation than only use LAS and DOSS.

Acknowledgements:

This work was supported by the Energy Resources R&D program of the Korea Institute of Energy Technology Evaluation and Planning (KETEP) grant funded by the Korea government Ministry of Knowledge Economy (No. 2012T100201728). Moreover, the authors wish to thank Schlumberger K.K for the encouragement of writing this paper.

References

1. Nguyen, Ngoc Thi Bich, 2011. Effect of Alkalis on Phase Behavior of Mixtures Between single and Double Tail Anionic Surfactant. Paper SPE-145473 presented at SPE Asia Pacific Oil and Gas and Exhibition, Jakarta, Indonesia, 20-22 September.
2. Sheng, James J, Modern Chemical Enhanced Oil Recovery, Gulf Professional Publishing/Elsevier, 2011

key words: Surfactant, Chemical Flooding, ASP Formulation

*Corresponding author(Wisup Bae), E-mail: wsbae@sejong.ac.kr

1) Department of Energy and Mineral Resources Engineering, Sejong University