World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Combination Approach Using Experiments and Optimal Experimental Design to Optimize Chemical Concentration in Alkali-Surfactant-Polymer Process

Authors : H. Tai Pham, Bae Wisup, Sungmin Jung, Ivan Efriza, Ratna Widyaningsih, Byung Un Min

Abstract : The middle-phase-microemulsion in Alkaline-Surfactant-Polymer (ASP) solution and oil play important roles in the success of an ASP flooding process. The high quality microemulsion phase has ultralow interfacial tensions and it can increase oil recovery. The research used optimal experimental design and response-surface-methodology to predict the optimum concentration of chemicals in ASP solution for maximum microemulsion quality. Secondly, this optimal ASP formulation was implemented in core flooding test to investigate the effective injection volume. As the results, the optimum concentration of surfactants in the ASP solution is 0.57 wt.% and the highest effective injection volume is 19.33% pore volume.

Keywords : optimize, ASP, response surface methodology, solubilization ratio
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020