Gloria Meyberg Nunes Costa, J Pet Environ Biotechnol 2014, 5:4
http://dx.doi.org/10.4172/2157-7463.S1.008

OMICS Group Conferences
Accelerating Scientific Discovery

2nd World Congress on
Petrochemistry and Chemical Engineering
October 27-29, 2014 Embassy Suites Las Vegas, USA

Solubility parameter and the application of carbon dioxide (CO_2) to enhance oil recovery

Gloria Meyberg Nunes Costa
Universidade Federal da Bahia, Brazil

The gas injection process is one of the most efficient enhanced oil recovery methods in the petroleum industry. Significant amounts of residual oil can be recovered by this procedure. A key parameter of a gas injection design is the Minimum Miscibility Pressure (MMP) that is the pressure at which the local displacement efficiency approaches 100%. Based on the concept of estimated solubility parameter calculated with the oil saturation pressure and reservoir temperature, properties readily available for any reservoir, a new methodology was developed to compute MMP for pure CO_2 and good results are observed when compared with experimental data from literature.

However, the injection of carbon dioxide (CO_2) to enhance oil recovery can induce precipitation and deposition of asphaltenes. The consequences generally include changes in reservoir wettability, formation damage, and wellbore and downhole facilities plugging, affecting the project budget due to production delays and costly clean up procedures. A new method was developed which enables the detection of the conditions at which the onset of asphaltene deposition occurs. This approach is solely based on monitoring the difference between the asphaltene solubility parameter and the solubility parameter of the solvent containing the non-asphaltene liquid and CO_2. The experimental data required for the implementation of the method are the oil composition stops at C^{7+} fraction, the bubble point pressure at the reservoir temperature and the SARA (saturates, aromatics, resins and asphaltenes) analysis. The applicability of this method to predict asphaltene onset precipitation is demonstrated by extensive tests using data from literature.

Biography

Gloria Meyberg Nunes Costa has completed his PhD at the age of 65 years from Universidade Federal da Bahia –Brasil. She has published 21 papers in reputed journals and serving as a review member of Fluid Phase Equilibria, Journal of Applied Polymer Science, Journal of Petroleum Science & Engineering.

gmeyberg@ufba.br