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| <b>Keynote Lecture KL 02</b>  |
| <b>Phase Equilibria and Enhanced Oil Recovery</b>   |
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| Key Word (3 words)  |
| Winsor; Interfacial Tension; Flooding.  |
| Abstract (less than 300 words)  |
| <p>Currently imagining a world without oil is imagining a debacle. With each passing day, our comfort requires more energy and a greater number of materials to synthesise commodities. The eventual need to move towards total independence from crude oil is undeniable, but we need time whilst trying to achieve the required technological development. Approximately two thirds of the oil still remain inside an already exploited reservoir, so the full exploitation of existing wells could be a way to buy that time.</p> <p>Surfactant enhanced oil recovery (EOR) methods are promising. A very low concentration of surfactant in brine is injected into the reservoir to reduce the water-oil interfacial tension, thus enhancing the mobility of oil retained in the pores of the rocks. The surfactant must meet many requirements: it must be miscible in water, stable in the presence of salts, and show a significant and equilibrated solubilization of oil and water. The search for this surfactant has been carried out many times in an arbitrary manner, frequently performing a large number of interfacial tension measurements until the goal is reached. However, the study of the phase equilibria involved (brine, oil and surfactant) is the shortest way to reach the goal. Winsor type III systems lead to ultra-low interfacial tensions and suitable surfactants for EOR.</p> <p>Thanks to the possibility of designing a practically unlimited number of them, ionic liquids (ILs) have become a powerful tool in the improvement of many processes, among them EOR applications. In this work, some studies involving ILs for oil recovery are presented. Studies based on interfacial tension, rigorous liquid-liquid equilibrium determinations, or pipette tests looking for Winsor type III systems, have been different attempts to define a suitable formulation for EOR. Many unsuccessful attempts but also some successful results are presented.</p> <p><b>Acknowledgements</b></p> <p>A. Soto acknowledges the Ministry of Science and Innovation and State Research Agency for financial support throughout project PGC2018-097342-B-I00, including European Regional Development Fund.</p> |
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