

## **Study of the Salting Out Effect of Strong Electrolytes on Water + Oil Solutions**

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Dissolved salts dramatically affect the phase equilibria of aqueous solutions and the problem of removing water from aqueous solutions of organic solvents is often encountered industrially. Such dehydration can be accomplished by various techniques and one of them is salting out which is frequently used. In this work we investigate the salting out of n-alkanes in water by strong electrolytes using an extension of the statistical associating fluid theory for attractive potentials of variable range which incorporates ionic interactions (SAFT-VRE) [A. Galindo, A. Gil-Villegas, G. Jackson, and A. N. Burgess, *J. Phys. Chem. B.*, 103, 10272 (1999)]. The systems are treated as water (1) n-alkane (2) cation (3) anion (4) four-component mixtures. The water molecules are modeled as spherical with four associating sites to mediate hydrogen bonding, while the n-alkane molecules are modeled as chains of tangentially bonded spherical segments interacting via square-well potentials. The salt is incorporated in the model as fully dissociated, and assumed to be present only in the water-rich phase. In this way, the anion and cation are modeled as two hard-spheres of different diameter in what concerns to their repulsive contribution. The experimental Pauling radii are used for each of the ions. Long-range Coulombic ion-ion interactions are treated in the mean spherical approximation at the level of the restricted primitive model, and the experimental water dielectric constant is incorporated to model ion-solvent electrostatic interactions. Water-ion attractive interactions are treated following previous work for aqueous solutions. We find that, in order to observe the desired salting-out effect in the mixture, no additional adjustable parameters are required. In this sense, the theoretical calculations are true predictions of the phase behaviour of these complex mixtures.