Hydrophobic Effects: Selected Results on Simple Model Systems

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In studies concerning aqueous solutions of biological interest, the mixtures encountered are usually multicomponent systems containing one or more polyelectrolytes or polyampholytes plus a number of small solutes of low molecular weight which are in part ionized. Such solutions provide the basis for the complex processes which are characteristic for life as we know it, for instance conformational changes of biopolymers, the binding of a substrate to an enzyme, the aggregation of lipids in biomembranes, etc. It is widely accepted that hydrophobic effects play a central role in these processes [1,2]. Apart from their importance in biology, they are also important in surfactant aggregation, mineral flotation, coagulation and so forth, i.e. in domains of interest for chemical engineers.

The simplest and most thoroughly studied hydrophobic effect is connected with the poor solubility of gases in water (compared to the solubility in other solvents) [3]. In fact, solubility measurements over wide temperature ranges have provided the most reliable data on which any rational discussion has to rest. Thus, in this communication I will first review the underlying thermodynamic formalism, and then present a few selected results on aqueous model solutions. If time permits, a brief survey of theoretical descriptions of hydrophobic effects will be presented.

1. C. Tanford, *The Hydrophobic Effect*, 2nd ed., Wiley, New York, **1980.**
2. A. Ben-Naim, *Hydrophobic Interactions,* Plenum, New York, **1980.**
3. E. Wilhelm, R. Battino, and R.J. Wilcock, *Chem. Rev.* **1977**, *77*, 219.