simplified model for aqueous solutions, one can easily derive exact answers for all the relevant questions [2]. This particular model, and its application to the study of the structural changes induced in the solvent, will be discussed.

References

1 A. Ben-Naim, 'Hydrophobic Interactions', Plenum Press, New York (1980).
2 A. Ben-Naim, *J. Phys. Chem., 82,* 874 (1978).

Function of Biomolecules as a Probe for Studying the Effects of Organic co-Solvents on Their Conformations

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Conformation changes associated with the function of biomolecules can bring about variations of the extent and specific structure of their hydrophobic areas exposed to solvent, with consequent local rearrangements of the solvent. This is one of the channels through which the solvent exerts its role in the functional equilibria of biomolecules. The function of biological macromolecules in perturbed aqueous solvent can therefore be a suitable probe for studying the response of macromolecule–solvent systems to perturbations caused by organic co-solvents.

We shall discuss the effects that the presence of some monohydric alcohols and of some amides in the aqueous medium have on some thermodynamic parameters related to the reaction of hemoglobin with oxygen.

A comparison with other data concerning functional equilibria of bovine liver β-galactosidase and conformational equilibria of ribonuclease and DNA will follow.

Hydrophobic Interactions and Stacking Forces: a Convenient Model System

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We consider solvent–biomolecule interactions and the role of solvent structural and isotopic alterations on the thermodynamic stability of biomolecular structures. Approaches to this problem range from the study of biomolecular functional stability, to that of the stability of small structural entities suitable of being taken as model systems for (parts of) larger molecules. We shall focus on this latter case and shall consider the dimerization process of small planar molecules (Methylene Blue). These are a convenient model system for the study of interactions responsible e.g. for base stacking in DNA. As an additional advantage, they do not form hydrogen bonds.

The experimental strategy includes H_2O–D_2O substitution and solvent perturbation by means of monohydric alcohols such as methanol, ethanol and propanol. The technique is spectrophotometric, assisted by microprocessor-based data acquisition and by high precision, computer-aided data analysis.

Simple thermodynamic analysis of results relative to different temperatures and concentrations, point out the role played in this type of process by solvent structure and perturbation, as well as by hydrophobic interactions and hydrogen mass.