

The solvation process in hydrophilic/hydrophobic bio-systems as probed by extended depolarized light scattering (EDLS) experiments

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The collective dynamics of water in diluted aqueous solutions of biosystems with different chemical topologies has been studied by extended frequency range depolarized light scattering (EDLS). Relaxation times and hydration numbers have been obtained as a function of temperature and solute concentration in solutions of small hydrophobes [1,2], amino acids [3], dipeptides [2-4] and model proteins [5-6]. The key result is that the more complex is the solute, the greater is the dynamical slowing down and the spatial extent of the perturbation induced on the collective dynamics of surrounding water [3,7]. This is in favour of the view that hydration dynamics of complex macromolecules, due to its collective character, cannot be trivially predicted based on the effects observed in simple model systems. Through the increasing complexity of the biomolecule is there potential for understanding some microscopic mechanisms of the solvation process.

References

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