

Microcalorimetry applied to the characterization of protein stability, interaction and solvation

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Interactions of proteins with small molecules like substrates and inhibitors or with other proteins are crucially based on changes of solvation of the new interfaces formed. The same is true for protein folding and thermodynamic stability. These biomolecular processes are accompanied by large changes in enthalpy and entropy which for the most part compensate each other and - as a matter of fact - lead to only small changes of the free energy. For theoretical approaches as well as for applications, e. g. in drug design, precise values on enthalpy and entropy contributions are requested in order to understand biomolecular reactions in a quantitative manner. Finally, the solvation of biomolecules on its own represents an unexplored field in research.

In this workshop an introduction to microcalorimetric methods is given which serve as widely used tools in the thermodynamic characterisation of biomolecular reactions. An overview is given to the physicochemical background as well as to applications. Finally, hands on experiments are carried out in the lab on isothermal titration calorimetry and/or differential scanning calorimetry. Participants are encouraged to take their own samples to this course.