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SUPRAMOLECULAR COMPLEXES STABILISED BY HYDROGEN BONDING AND THEIR FLEXIBILITY

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The supramolecular chemistry is the part of chemical science that penetrates other fields related to physics, biology, material science, molecular sensing and crystal engineering, to mention a few. The intermolecular interactions are present in all of those but not only and have a major role in the understanding of reactivity and self-organization of molecules giving the basis to understand the nature. Thus, the ability to control those is one of the milestones in the long way towards mimicking the complicated world surrounding us.

The stability of complexes is the key feature to tune the properties of the matter. This is especially true when one realizes the stability of polymers, for example, may be tuned in this way. One of the method to tune intermolecular interactions is the steric effect.[1] On the other hand, the electronic effect in the Hammett sense is much less used in supramolecular chemistry but still this is valid for tuning the properties of complexes.

It is commonly known that in the rigid molecules carrying hydrogen bonding donors and acceptors arranged in a way that allows efficient geometrical fitting of those the stability of formed complexes is high. Thus, any property that is able to disturb the geometry have the effect on association. One of those effects is the electron repulsion and geometry change. However, the mentioned change in geometry may be a tool in molecular sensors. This is due to the fact that the said effect influences the electron distribution within molecule giving the rise to change in the absorption or fluorescence spectra. Thus, it is mandatory to study in detail the effects of the change of geometry upon interaction with other molecules before such molecules are going to be used in, for example, sensing. Thus, the topic of the presentation will be focused on a) tuning the intermolecular interactions, b) conformational change in supramolecular complexes formed by relatively small molecules (Fig. 1) and c) the additional factors (tautomerism, kinetic trap[2]) that may accompany the association.

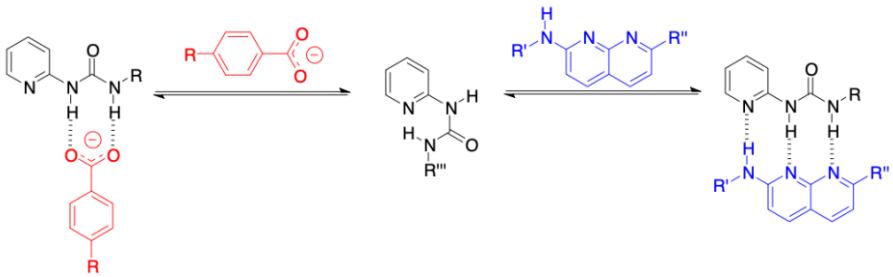

Figure 1. The conformation dependent on association and the substituent type

References

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