CHAOTROPIC EFFECT AS AN ASSEMBLY MOTIF IN POLYOXOMETALATE SUPRAMOLECULAR CHEMISTRY

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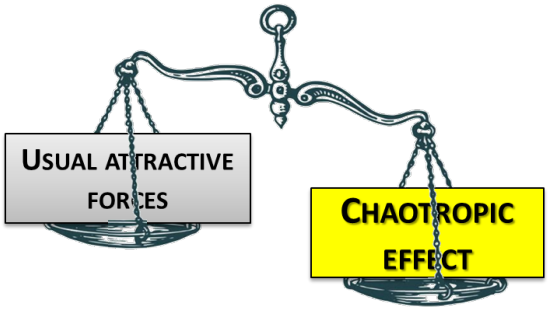
Abstract. The ability of biochemical substances such as phospholipids, glycans, or proteins to interact with discrete inorganic species is essential for some biological functions.[1] Then, designing supramolecular hybrid architectures including dynamics and responsive behavior requires a fine balance between the conglomerate of weak forces such as electrostatic, ion-dipole, dipole-dipole, hydrogen-bonding, dispersion, etc., that drives the aggregation processes. Recent reports highlight the intriguing properties of certain inorganic polynuclear anions, such as polyoxometalates (POMs) or polynuclear clusters for their extremely high propensity to interact strongly in aqueous solution with non-ionic organic components such as macrocycles or surfactants.[2,3,4] This striking driving force has been identified as a strong solvent effect arising from chaotropic nature of the polyoxometalates in aqueous solution. In this communication, we will highlight the origin of this effect by proposing a classification of the chaotropic character of a large series of polyoxometalates, ranging from the Keggin type ions to the large nanoscopic ring-shape molybdenum blue. However, we will give some relevant examples showing how the chaotropic effect can be used to monitor supramolecular hybrid assemblies such as molecular core-shell, supramolecular MOFs or POM-containing bilayer type membrane.



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