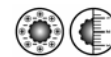


What Is A Chaotropic Agent?



As a quick web search will confirm, “defining” a chaotropic agent is easy. A chaotropic agent is a structure disrupting additive, examples of which might include, surfactants, low molecular weight polymers, urea, some salts, etc. One might also think of a chaotropic agent as an additive that induces or increases the “chaos” or entropy in a system.

A more complex question however, is what is the effect of a chaotropic agent on the stability of my formulation with regard to aggregation. The effect of a chaotropic agent on formulation stability is depend upon a number of factors, with the type of formulation being one of the most important. If it is a formulation of hard spheres, then one might adsorb a polymer or surfactant to the surface of the spheres to minimize interactions. In comparison to an aggregated system, the more fully dispersed system of particles would have a higher entropy, i.e. more chaotic. Ergo, the additive would be classified as a dispersion stabilizing chaotropic agent. If one is dealing with a protein formulation on the other hand, surface adsorbed chaotropic agents can also “disrupt” the protein tertiary structure, leading to protein denaturation and subsequent aggregation; thereby decreasing the stability of the formulation.

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