Nanoparticle Doped Water: From Particle Structure to Water Properties

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Abstract

Water is the second-most common molecule in the universe and the most studied material on earth. It covers 71% of the earth's surface, and the human body contains 60-70% water. Surprisingly though, many of the water functions and properties are poorly understood.

In this talk, I will describe water that is doped with insoluble nanoparticles. The doping process, which is owned by Do-Coop Technologies Ltd., takes advantage of water anomalies, and results in water with different properties. This doped water contains 100-1000 times more CO_2 than deionized water, it can dissolve and disperse organic compounds in a different manner than deionized water, increases heat stability and activity of protein and the wetting behavior is different from deionized.

From the particle point of view, there is a significant change in the shape and the crystallographic symmetry of the nanoparticles following the doping process. While the source powder contains agglomerates of rectangular particles with a cubic symmetry, following the doping process the particles are separated, are spherical and have different symmetry. In addition, they are surrounded by a water layer that is stable even under extreme physical conditions. Another issue to be discussed is the characterization of water vapor using a unique spectroscopy technique revealing differences in the electronic structure.

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