

Sedimentation of binary colloids: Brazil nuts and icebergs

Inst. of Industrial Science, The Univ. of Tokyo Mathieu Leocmach ¹, Paddy Royall
and Hajime Tanaka

The hard sphere is *the* basic system of statistical mechanics, widely investigated but still rich of unknown phenomenon. We use binary colloidal solutions as a good approximation for binary hard-sphere mixtures [1]. And colloids are sufficiently large to be distinguished to single particle resolution by confocal microscopy. We focus on a system with majority species being smaller than the minority species by a factor 2.

Experimental observations lead us to think about a yet unconsidered [2] binary fluid + one component crystal equilibrium, the crystal being made of the majority species. Taking this phase coexistence as a hypothesis, we study theoretically [3] the phase behavior and the sedimentation [4] of our colloid mixture.

Going further, we also investigate experimentally the sedimentation of the same colloidal solution with added non adsorbing polymers. The depletion interaction between colloids (Asakura Oosawa potential) [5] [6] induced by the polymers leads to a wealth of phases and sedimentation behaviors not yet fully explained.

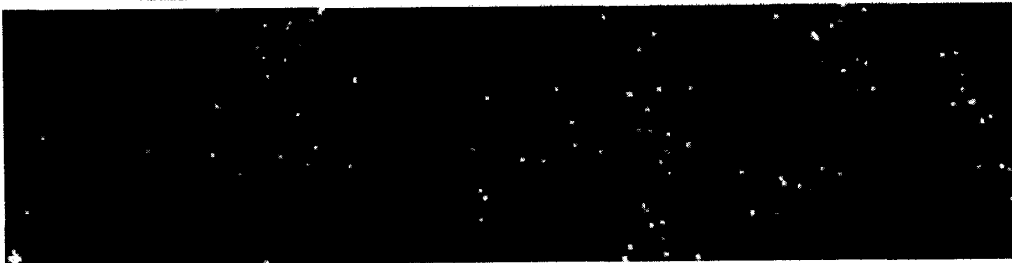


Figure 1: binary fluid + one component crystal

References

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¹E-mail: mathieu@iis.u-tokyo.ac.jp