

Title: Reversible cluster formation in colloidal dispersions with short-range attractive interactions

Author: Ramón Castañeda-Priego.

Affiliation: Division of Science and Engineering, Campus León, University of Guanajuato. Loma del Bosque 103, 37150, León, Mexico.

e-mail: ramoncp@fisica.ugto.mx

Abstract:

Particle aggregation or clustering is an obligatory step for the initiation of the phase separation or the large-scale formation of materials that exhibit a heterogeneous structure, such as gels and porous media. Nevertheless, even though the macroscopic structure of such materials depends on the shape and size of the resulting clusters or aggregates, the cluster formation at equilibrium and its corresponding morphology are not fully understood. Combining molecular simulations, experimental characterizations, and theoretical calculations, we conclusively demonstrate that the cluster morphology in short-ranged attractive colloidal systems at and around equilibrium conditions can be uniquely determined by the reduced second virial coefficient [1]; our findings link the reversible colloidal aggregation with the extended law of corresponding states [2].

Keywords: colloids, reversible aggregation, short-range interactions .

Acknowledgements: Author thank financial support provided by DAIP (UG) and Conacyt (Grant. No. A1-S-9098).

References:

[1] F. Soto-Bustamente, N. E. Valadez-Pérez, Y. Liu, R. Castañeda-Priego and M. Laurati, *Journal of Colloid and Interface Science*, 2022, 618, 442.

[2] N. E. Valadez-Pérez, Y. Liu, R. Castañeda-Priego, *Physical Review Letters*, 2018, 120, 248004.