Supporting Information of the manuscript

The role of hydrodynamic interactions on the aggregation kinetics of sedimenting colloidal particles

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1) Different cluster conformations obtained for Pe = 0.1 and at $\Phi = 0.05$.

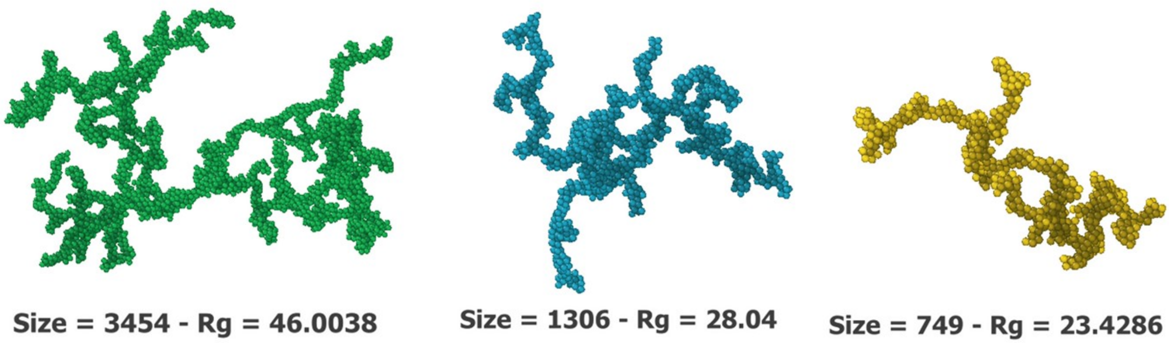

Figure S1 Different cluster conformations obtained for Pe = 0.1 and Φ=0.05 employing the RPY approximation of HI with the PSE algorithm.

2) Average cluster mass obtained at $\Phi = 0.05$ and various *Pe* numbers.

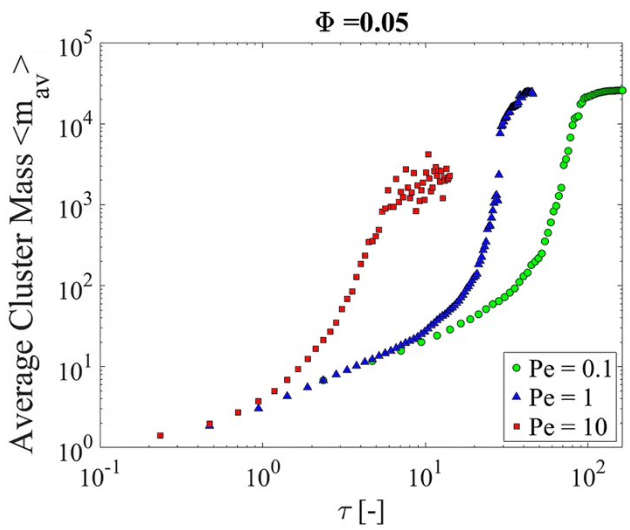

Figure S2 Dimensionless time evolution of the average mass for clusters generated under different flow conditions (Pe equal to 0.1, 1, and 10) and particle volume fraction equal to Φ =0.05.

3) Dimensionless time evolution of the average radius of gyration $\langle R_g \rangle$ normalized by the radius of the primary particles R_p obtained from different simulations.

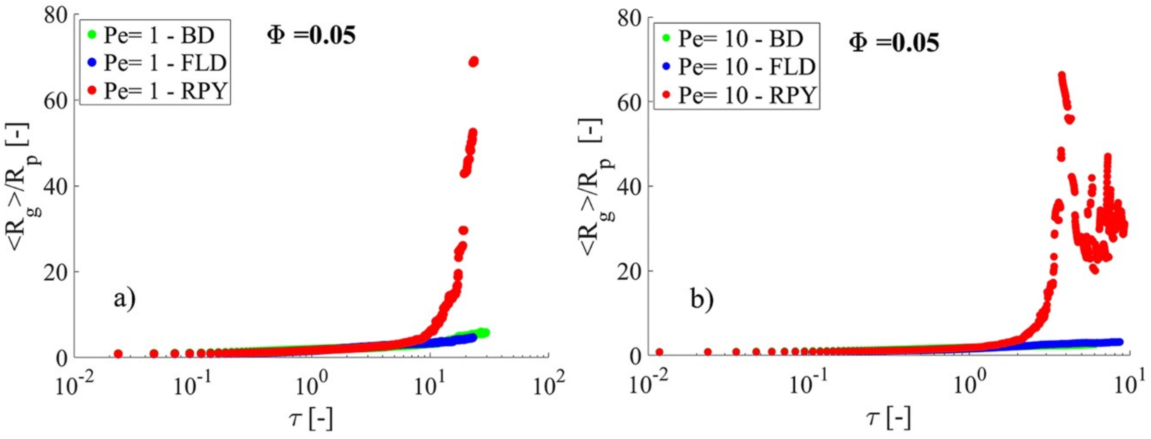

Figure S3 Dimensionless time evolution of the average radius of gyration $\langle R_g \rangle$ normalized by the radius of the primary particles R_p obtained from simulations employing the RPY approximation of HI with the PSE algorithm (red curve), the FLD method with only lubrication forces (blue curve), and a simple BD without HI (green curve) for Φ=0.05 and Pe equal to 1 (a) and 10 (b).

4) Effect of tangential contact forces on the cluster morphology for simulations performed using the *FLD* algorithm.

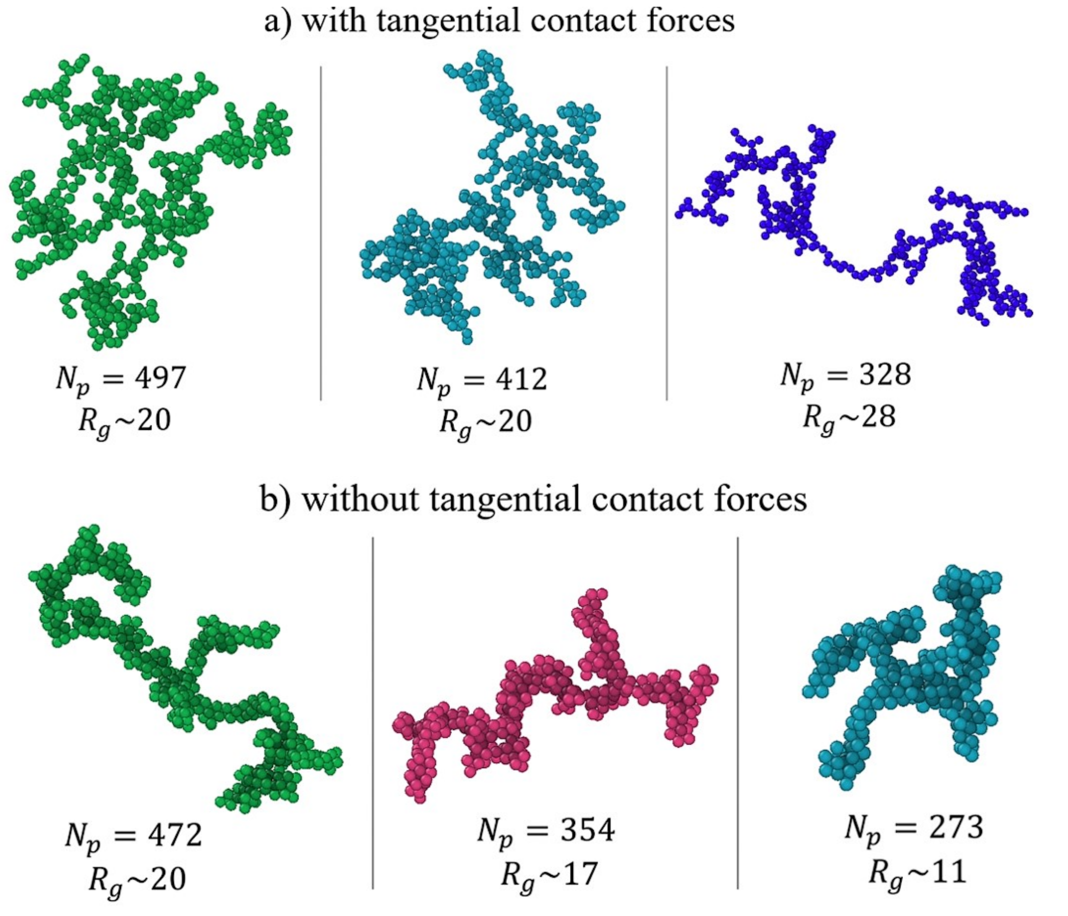

Figure S4 Effect of tangential contact forces on the cluster morphology at $\Phi = 0.05$ *and Pe=1 computed using the FLD algorithm. Case a) and case b) correspond to simulations where tangential forces were included and neglected, respectively.*

5) The evolution of fractal dimension and average particle coordination number for simulations performed with and without tangential forces

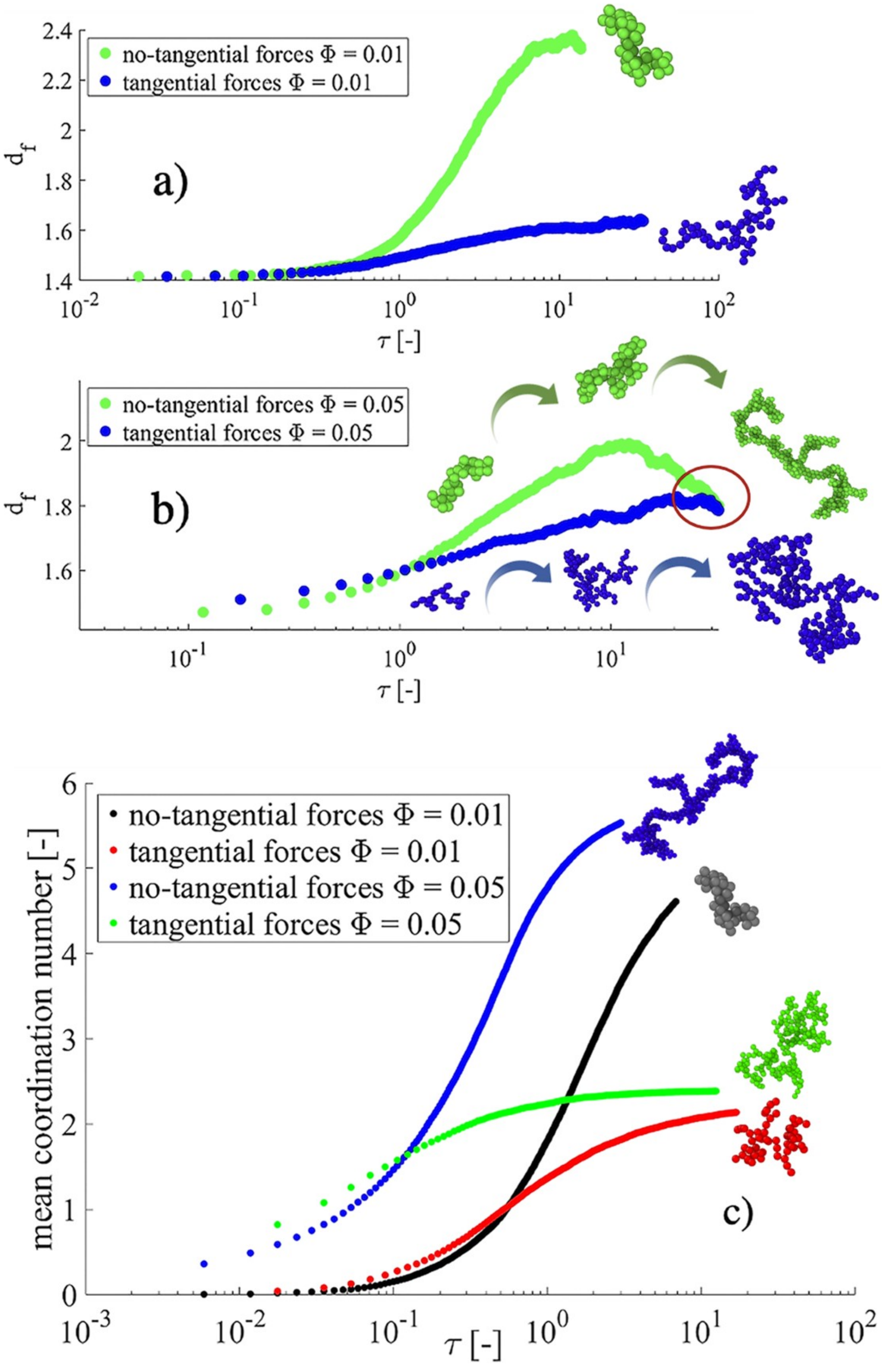

Figure S5 The evolution of fractal dimension d_f *(Figure S5a and S5b) and average particle coordination number (c) for simulations performed with and without tangential forces for two different particle volume* *fractions equal to 0.01 and 0.05 at Pe=1. Low values of the fractal dimension (1.6-1.9) and mean coordination number (~2) indicate very open structures which are typical of clusters formed under DLCA conditions.*

6) Plot of the interparticle potential resulting from the attractive vdW and repulsive contact force.

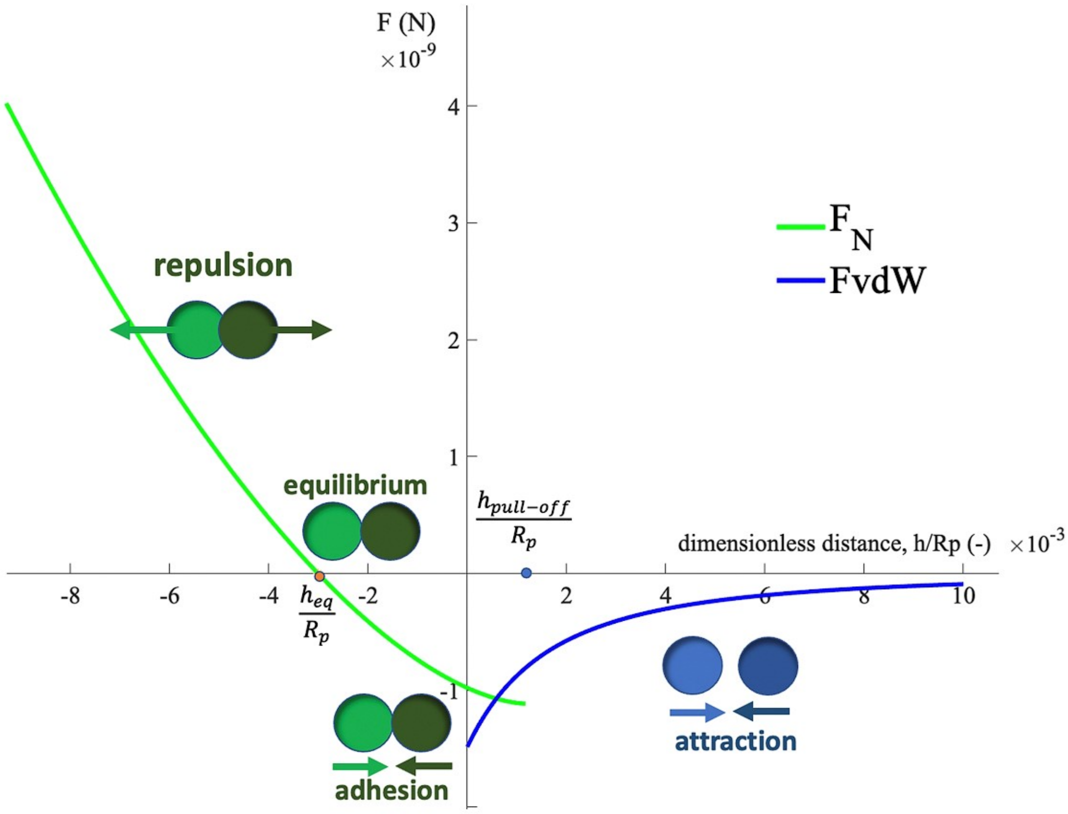

Figure S6 Plot of the interparticle potential resulting from the attractive VdW and repulsive contact force.