Aggregation Simulation for Brownian Particles in Microfluidic Channels

박지희, 윤병준*

포항공과대학교

(bjyoon@postech.ac.kr*)

Aggregation of nano particles in complex electroosmotic flows is studied by using Brownian dynamics simulation. The colloidal interaction is described by the DLVO theory. The hydrodynamic interaction among the particles in viscous fluids is approximated by the summation of the singularity solutions of Stokes flow outside each single sphere. The trajectories of Brownian particles are obtained in 2- and 3- dimensional spaces by integrating the Langevin equation. The simulation method is first tested by calculating the Stokes-Einstein diffusivity of Brownian spheres. It will be determined how fluid flow influences on the behavior of colloidal particles and the structure of the clusters. Based on the present work, the way to control the aggregation of Brownian particles will be devised by controlling the influence of external flow and the other colloidal forces.