Assembly of anisotropic colloids under electric field

이지선, stefano sacanna[1], Hyunjoo Park, David J. Pine[1],
정희태*
KAIST; [1]New York University
(heetae@kaist.ac.kr*)

Assembly of micro-scale units has been interested not only for physical study but for various applications such as photonic band gap material, diffraction gratings or biosensors. Specifically, anisotropic colloids such as dumbbell or snowman like colloids have been interested recently due to its unique optical/electrical properties. The strength of induced dipole moment differs by each direction of particle so that this anisotropic dipole moment induces directional assembly of micro-particle under AC field.

In this study, we fabricated dumbbell like colloids using seeded emulsion growth method. We applied AC electric field onto anisotropic colloidal dispersion and observe their assembly behavior under microscope. Long axis of dumbbell colloids have been aligned along the direction of E-field and closely packed each other. This behavior can be controlled by varying voltage and frequency of AC field.