Assembly of anisotropic colloids using electric field and observation of its optical property

이지선, Hyunjoo Jung, Stefano Scanna[1], David Pine[1],
정희태*
KAIST; [1]New York University
(heetae@kaist.ac.kr*)

Assembly of colloids 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 applied AC electric field onto colloidal dispersion which has dumbbell shaped particle fabricated seeded emulsion growth method. Long axis of dumbbell colloids have been aligned along the direction of E-field and closely packed each other. If isotropic colloids are assembled, we can observe specific reflecting color under cross polarizer. This behavior can be controlled by varying voltage and frequency of AC field.