

Controlled Synthesis of Spherical or Rod-like Titania

유형균^{1,2}, 이기라³, 강지환^{1,2}, 은태희^{1,2}, David J. Pine⁴,
양승만^{1,2,*}

¹한국과학기술원 생명화학공학과;

²광자유체집적소자 창의연구단;

³한국기초과학지원연구원 서울센터; ⁴뉴욕대학 물리학과
(smyang@kaist.ac.kr*)

Titania particles are commonly used as ultra-white pigments because of their high refractive index and no absorption at visible. As well, they have taken lots of attractions due to the light localization within their random media which is potentially useful for random lasing. Therefore, it is great challenge to synthesize uniform titania particles for controlling their optical properties more precisely. In general, for monodispersity of particles, it is crucial to separate seed formation and growth stage by controlling the reactivity of precursor. Recently, several research groups have suggested synthetic routes for monodisperse spheres by using less reactive precursors or stabilizers. In this presentation, we demonstrate that monodisperse titania spheres are successfully synthesized by controlled hydrolysis of EG-modified titania precursors with surfactant and their colloidal clusters were also produced by emulsion encapsulation and shrinkage technique. In addition, micron-sized titania rods were synthesized under different reaction condition, which were then annealed for forming crystalline titania rods of anatase or rutile phase.