Preparation of monodisperse titania particles for optical applications

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Monodisperse colloidal particles have been used as building blocks to fabricate ordered structure by self-assembly. However, the preparation of monodisperse colloid has been mostly limited to silica or polymer latex for photonic crystal. Meanwhile, titania has been considered as an ideal candidate for optical applications due to high refractivity and low absorption of light. Typically, spherical titania has been prepared by the precipitation of titania precursor in organic solvent. However, it is not easy to prepare monodisperse particles due to simultaneous nucleation and growth by fast hydrolysis of the precursor. In this presentation, the preparation of size-controlled titania particles by using steric and electrostatic methods will be described. In addition, it will be shown that titania has the potential possibility as a good light scatterer.