Fabrication of Carbonized Titania Particles

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We fabricated carbonized titania particles to get color from white titania powder. First, uniform titania microspheres were synthesized by sol-gel process, in which titanium(Ⅳ) isopropoxide (TTIP) were used as precursor and dodecylamine (DDA) as a catalyst and stabilizer in methanol and acetonitrile co-solvent. The resultant particles had narrow size distribution ranging from 600 and 700 nm. Next, Carbonized titania particles were fabricated by heating titania powder under N_2 gas flow at 500, 700 and 900 ℃. Color of carbonized powder was dark green. Carbon content of particles was between 2.0 and 3.0 wt%. The particles were characterized by reflected light microscopy, UV-visible reflectance spectrometer, powder X-ray diffraction(XRD), elemental analysis(EA), scanning electron microscopy(SEM) and fouriertransform infrared spectrometer(FT-IR). Hydrocarbon chain of DDA was useful for fabrication of carbonized titania particles. When carbonized titania particles were heating under air atmosphere at 500 ℃, the color turned pale green. Carbon content of particles decreased to less than 1.3 wt%.