

Preparation of fine, uniform nitrogen- and sulfur-modified TiO₂ nanoparticles from titania nanotubes

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Abstract TiO₂ nanoparticles modified with nitrogen and sulfur were prepared from titania nanotubes by a facile wet chemistry method. The samples synthesized with different thiourea/TiO₂ ratios showed a uniform nanoparticle size distribution centred at approximately 10 nm with a developed specific surface area of 246 m² g⁻¹. These modified nanosized photocatalysts exhibited higher photocatalytic activity for the degradation of gaseous isopropanol than unmodified titania nanotubes under visible illumination. This could be attributed to the synergistic effects of a large specific surface area, strong absorption in the visible region, a redshift in the adsorption edge, and surface adsorption modification induced by nitrogen and sulfur compounds.

PACS [81.16.Be Chemical synthesis methods](#)
[82.65.+r Surface and interface chemistry; heterogeneous catalysis at surfaces](#)
[68.43.Mn Adsorption kinetics](#)
[61.46.Df Structure of nanocrystals and nanoparticles \("colloidal" quantum dots but not gate-isolated embedded quantum dots\)](#)
[82.50.-m Photochemistry](#)
[81.16.Hc Catalytic methods](#)

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