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Analysis of TiO₂ nanocomposite using x-ray spectrometry

Nanostructures of Titanium oxide are being studied for many promising applications due to their excellent photo-catalytic properties [1]. We have synthesized low-dimensional TiO₂ nanoparticles by laser pyrolysis technique. The synthesis process has been optimized for the deposition of highly pure and nearly mono-dispersed TiO₂ nanoparticles on silicon substrates [2]. The surface morphology of the TiO₂ nanostructure has been investigated using combined x-ray reflectivity and grazing incidence x-ray fluorescence measurements [3]. Transmission electron microscopy and grazing incidence x-ray diffraction measurements were also carried out for the deposited TiO₂ nanostructures to evaluate surface coverage and crystalline structure of the particles. The average particle size of TiO₂ nanostructure estimated using transmission electron microscopy was found to closely agree with the x-ray standing wave analysis. The combined x-ray spectrometry and Transmission electron microscopy profiles are shown in Fig. 1(a) and Fig. 1(b) respectively.

Primary author: Dr DAS, Gangadhar (Elettra-Sincrotrone Trieste)

Co-authors: Prof. TIWARI, Manoj (bIndus Synchrotrons Utilization Division, Raja Ramanna Centre for Advanced Technology, Indore-452013, India); Dr AQUILANTI, Giuliana (Elettra Sincrotrone Trieste)

Presenter: Dr DAS, Gangadhar (Elettra-Sincrotrone Trieste)

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