(02-065) - One-step synthesis of CuO/SrTiO3 heterostructure by a simple hydrothermal method

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A novel one-step hydrothermal route was used for the in situ synthesis of heterostructured materials with photocatalytic activity. In this work, CuO/SrTiO3 nanoparticles were synthesized and characterized extensively by X-ray diffraction, scanning electron microscopy, scanning transmission electron microscopy, energy dispersive X-ray spectroscopy, X-ray fluorescence spectroscopy, diffuse reflectance UV-Vis spectroscopy, and Fourier transform infrared spectroscopy. The XRD patterns indicate two pure phases, with CuO indexed to monoclinic CuO (ICDS code no 160-630) and SrTiO3 indexed to cubic phase (ICDS code no. 181-652). A quantitative phase analysis using the Rietveld method confirmed that each sample contained the same proportions of the two phases. A sharp increase in absorption in the region of visible light in the UV absorption spectrum was attributed to electronic coupling in the materials' structures. Compared to single-phase SrTiO3, the heterostructured materials showed enhanced photocatalytic activity.