Supporting information

Nanorod-like α-Bi_2O_3 nanoparticles: a highly active photocatalyst synthesized by using g-C_3N_4 as a template

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Sample Characterization:

The microstructures of the samples were observed by field emission microscope (FESEM, JEOL 6701F). Transmission electron microscopy images were recorded with a field emission transmission electron microscope (2100F, JEOL Co., Japan). A surface-area analyzer (BEL Sorp-mini Ⅱ, BEL Japan Co., Japan) was used to measure the surface areas of samples through nitrogen adsorption and desorption isotherms at 77K. The crystal structures of the samples were determined with an X-ray diffractometer (X'pert Powder, PANalytical B. V., Netherlands) with Cu-Kα radiation. Fourier transform infrared (FT-IR) spectra were obtained with an IRPrestige-21 FTIR (Shimadzu) spectrophotometer. The optical properties of the samples were measured by UV-vis diffuse reflectance spectroscopy method by using UV-2600 (Shimadzu Co., Japan) spectrophotometer equipped, with $BaSO_4$ as the reflectance standard, and the optical absorptions were converted from the reflection spectra according to Kubelka-Munk equation. Thermogravimetric-differential thermal analysis (TG-DTA; Shimadzu, DTG-60H, Japan) was used to study the formation mechanism of the nanorod-like α-Bi_2O_3.

Photocatalytic activity measurements:

The photocatalytic oxidations of gaseous IPA were carried out under the visible light with the wavelengths of 420 nm ≤ λ ≤ 800 nm. The light source was a 300 W Xe-arc lamp (10A imported current, focused through a 50×50mm shutter window) equipped with some wavelength cutoff filters and a water filter. Typically, 100 mg photocatalyst was bespread uniformly on a glass dish with an area of 9 cm^2. A certain amount (~1400 ppm) of gaseous IPA was injected into the vessel and kept for 2 h in the dark before irradiation. During the irradiation by visible light, 0.5 ml of the gas was sampled everyone 1 h intervals. The products were analyzed with a gas chromatograph (GC-2014, Shimadzu, Japan) with a flame ionization detector (FID).

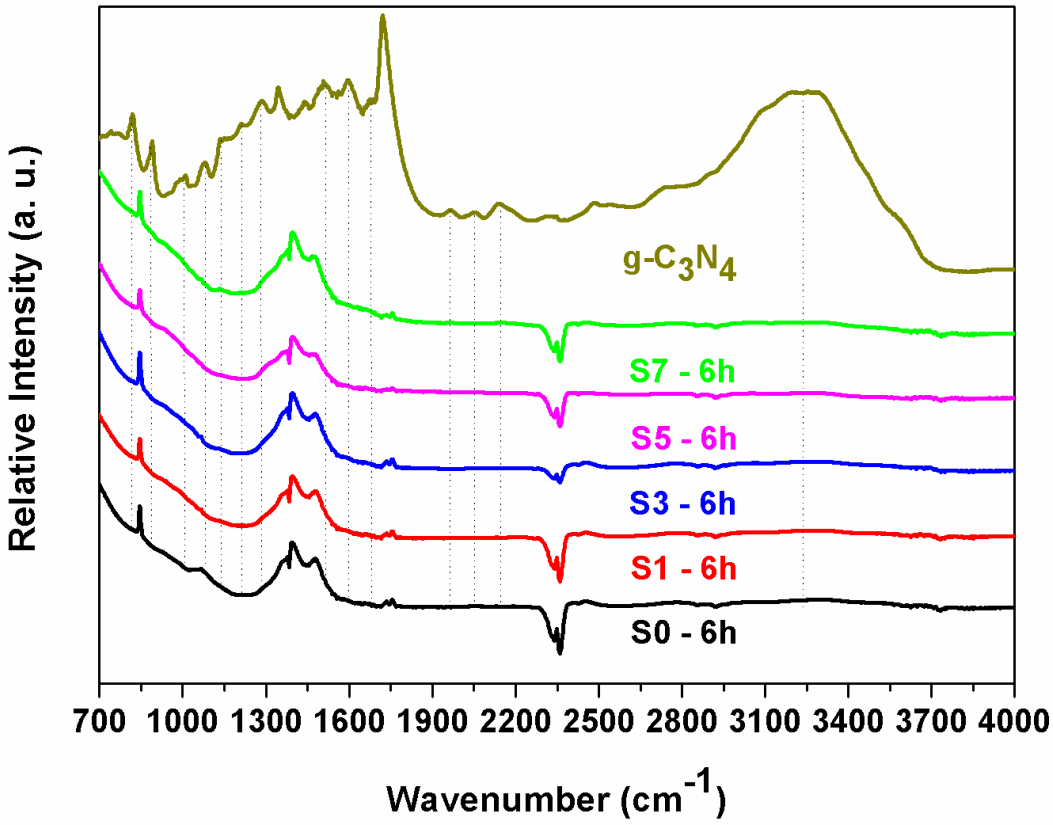

Figure S 1 The FT-IR spectra of all the α-Bi_2O_3 samples induced by g-C_3N_4 with 6 hours' calcinations

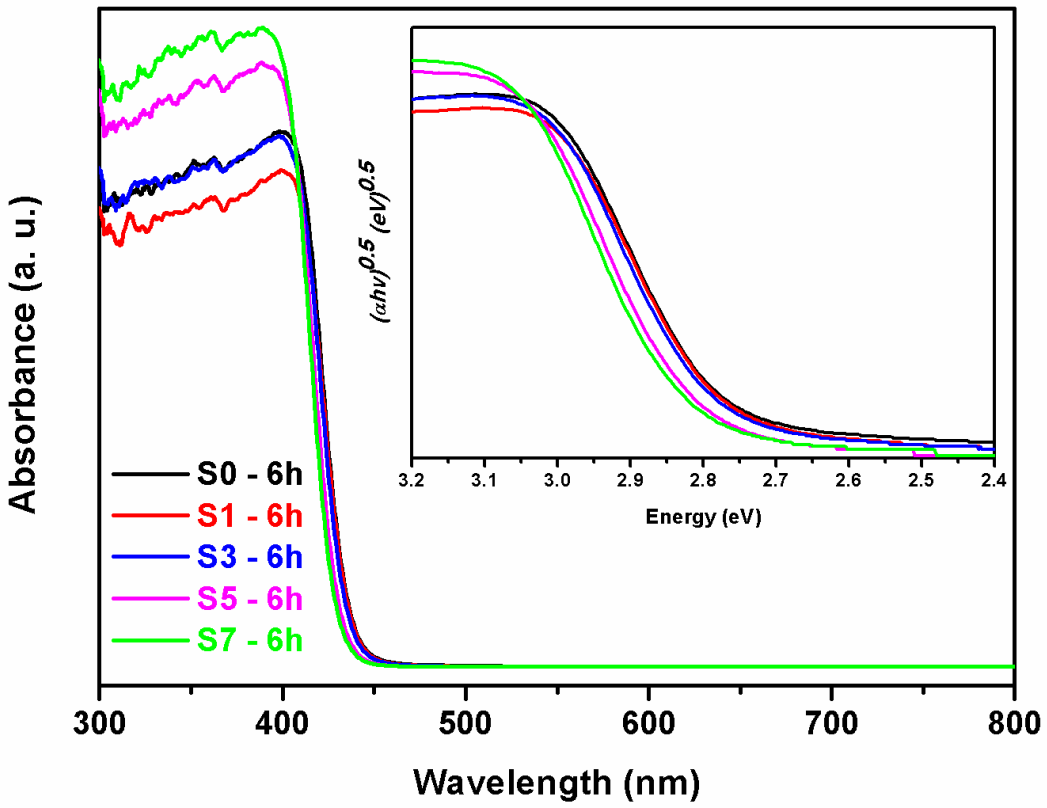

Figure S 2 The UV-vis DRS spectra of all the α-Bi_2O_3 samples induced by g-C_3N_4 with 6 hours' calcinations

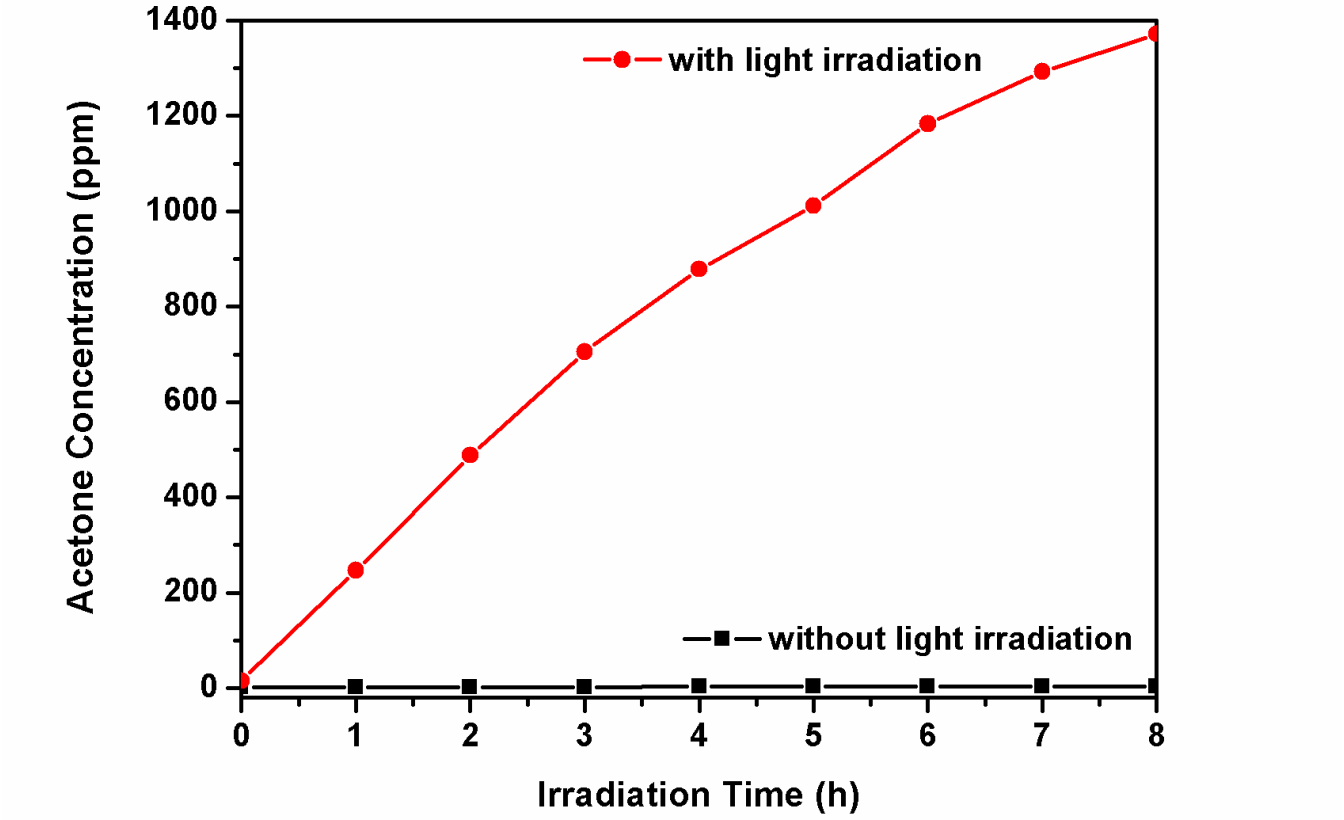

Figure S 3 Photocatalytic oxidations of gaseous IPA over S7 - 6h with and without visible light irradiation.

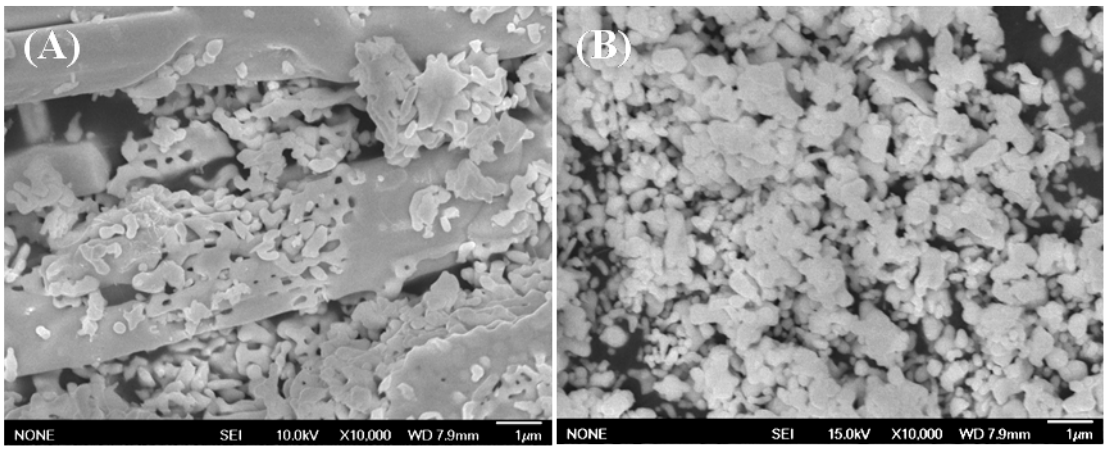

Figure S 4 The SEM spectra of the α - Bi_2O_3 by using the $(NH_4)_2CO_3$ [inorganics (A)] and citric acid [organics (B)] as the template to treat the microrod-like α-Bi_2O_3