PO2019

Photocatalytic activity of Bismuth vanadates under visible light irradiation: Applications in photoelectrocatalysis and inactivation of bacteria

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Bismuth vanadate ($BiVO_4$) thin films were prepared by radio frequency (RF) plasma sputtering in reactive Ar/O_2 atmosphere using two separate targets of Bismuth oxide and Vanadium. The coatings were deposited both on silicon, soda-lime glass and FTO glass. The as-grown films were converted from amorphous to crystalline by a post deposition annealing in air at 400 °C for 2h.

The samples were characterized by X-ray diffraction, scanning electron microscopy, UV-Vis and energy dispersion spectroscopy. The characterization of the specimens showed a crystallized monoclinic structure and a good light absorption in the visible range. In fact the optical band gap deduced from the reflectance spectra was 2.5 eV. Preliminary tests demonstrate that $BiVO_4$ thin films are photocatalytically active and able to inactivate bacteria.

Keywords
Magnetron Sputtering
BiVO4
Photocatalysis
Antibacterial