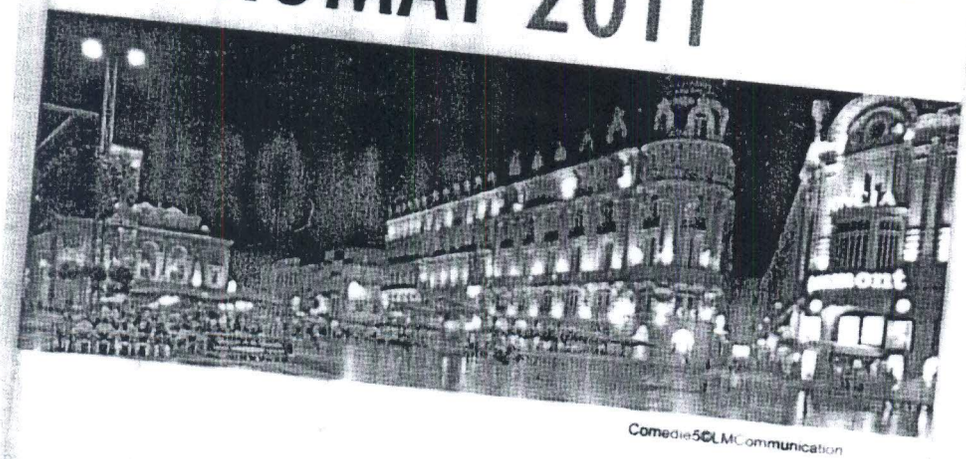
EUROMAT 2011

FEMS



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European Congress
on Advanced Materials and Processes

12-15 September 2011

Montpellier, France

SF2M
Société Française
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di Metallurgia

Main Topics

Functional Materials: Properties & Applications
Magnetic Materials; Materials for Nanostructures; Functional Polymeric Materials; MEMS, NEMS and Devices

Structural Materials: Properties & Applications
Advanced Metals; Advanced Ceramics; Hybrid and Composite Materials; Advanced Concepts in Structural Materials

Materials Processing
Solidification and Solid State Transformations; Joining; Powder Routes: from Synthesis to Materials; Coatings and Surface Engineering; New concepts in Materials Processing

Characterisation and Modeling
Microstructural Characterisation Techniques; Mechanical Characterisation Techniques ; Materials Modeling on all Length Scales

Energy and related Applications
Energy Production, Transportation and Management; Materials for Energy in a Sustainable Society; Materials for Transportation

Health Care Applications

Materials for Health Care Applications

Education

Topic Area	C Processing	
Topic	C3 - Powder routes : from synthesis to materials	C31-P-1-03
Symposium	C31 - Powder Synthesis and Processing	**1494**
Session		

Synthesis and visible-light photocatalytic performance of BiVO4 nanostructures obtained by hydrothermal method

V. Mendonça (Unesp, São Carlos, Brazil), W. Avansi, C. Ribeiro, E. Longo

W. Avansi ( ), w_avansi@yahoo.com.br
V. Mendonça ( )
C. Ribeiro ( )
E. Longo ( )

Abstract

Recently, BiVO4 with a monoclinic scheelite structure (m-BiVO4) was considered an advanced material for photocatalytic applications [1,2]. Traditional methods for synthesizing m-BiVO4 usually involve solid-state or melting reactions at high temperatures. The main objective of this work is study the synthesis and visible-light photocatalytic performance of m-BiVO4 nanostructures obtained by an environmental friendly and one step hydrothermal method. In a typical procedure, a solution containing appropriate amount of Bi(NO3)35H2O was added directly to a 0.06M solution of peroxovanadate prepared by mixing H2O2 and V2O5, according to procedure recently reported by our group [3]. Then, this mixed solution was placed in a 100 mL hydrothermal cell and subjected at different temperature and time of treatments. The powder precipitate was separated by centrifugation, washed with distilled water for several times and then dried at 50 °C for 24 h. The as-prepared samples were characterized with X-ray diffraction (XRD), Raman spectroscopy, Transmission Electron Microscopy (TEM) and UV-vis diffuse reflectance spectra. X-ray diffraction and Raman spectroscopy revealed the formation of BiVO4 with a monoclinic scheelite structure for the samples obtained through hydrothermal treatment at 1400C during 24 hours. The Transmission Electron Microscopy (TEM) shows that as-obtained products have a size less than 30nm. Through UV-vis diffuse reflectance spectra the band gap (Eg) of the samples is estimated to be about 2.4 eV. The as-obtained m-BiVO4 nanostructures showed high photocatalytic activity, which was demonstrated by degradation of Rhodamine-B (RhB) solution under visible-light irradiation (λ>420 nm).

[1] – F. Dong, Q. Wu, J. Ma, Y. Chen, Phys. Status Solidi A 206 (2009), 59–63.

[2] – Y. Zhou, K. Vuille, A. Heel, B. Probst, R. Kontic, G. R. Patzke, Applied Catalysis A: General 375 (2010) 140–148.

[3] - W. Avansi, C. Ribeiro, E.R. Leite and V.R. Mastelaro, Crystal Growth & Design, Vol. 9, No. 8, 2009.