Accepted Manuscript

Full Length Article

Influence of Cu substitution on the structural ordering, photocatalytic activity and photoluminescence emission of Ag $_{3-2x}$ Cu $_x$ PO₄ powders

Wyllamanney da S. Pereira, Júlio C. Sczancoski, Yormary N.C. Calderon, Valmor R. Mastelaro, Gleice Botelho, Thales R. Machado, Edson R. Leite, Elson Longo

PII: DOI: Reference:	S0169-4332(17)33796-0 https://doi.org/10.1016/j.apsusc.2017.12.202 APSUSC 38072
To appear in:	Applied Surface Science
Received Date: Revised Date: Accepted Date:	26 September 201719 December 201721 December 2017



Please cite this article as: W.d.S. Pereira, J.C. Sczancoski, Y.N.C. Calderon, V.R. Mastelaro, G. Botelho, T.R. Machado, E.R. Leite, E. Longo, Influence of Cu substitution on the structural ordering, photocatalytic activity and photoluminescence emission of Ag $_{3-2x}$ Cu $_x$ PO₄ powders, *Applied Surface Science* (2017), doi: https://doi.org/10.1016/j.apsusc.2017.12.202

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Influence of Cu substitution on the structural ordering, photocatalytic activity and photoluminescence emission of Ag_{3-2x}Cu_xPO₄ powders

Wyllamanney da S. Pereira¹, Júlio C. Sczancoski^{1*}, Yormary N. C. Calderon²,

Valmor R. Mastelaro², Gleice Botelho³, Thales R. Machado¹, Edson R. Leite¹,

and Elson Longo¹

¹Universidade Federal de São Carlos (UFSCar), Departamento de Química, São Carlos-SP, Brazil

²Universidade de São Paulo (USP), Instituto de Física de São Carlos, São Carlos-SP, Brazil

³Universidade Federal do Tocantins (UFT), Química Ambiental, Gurupi-TO, Brazil

^{*}Email: <u>jcsfisica@gmail.com</u>

Abstract:

high photocatalytic Materials presenting performance interesting and photoluminescence emissions are promising candidates for photodegradation of organic pollutants discharged into natural waters as well as for development of new electrooptical devices, respectively. In this study, $Ag_{3-2x}Cu_xPO_4$ (x = 0.00, 0.01, 0.02, 0.04 and 0.08) powders were synthesized by the precipitation method. The long- and short-range structural ordering was affected when the copper (Cu) content was increased in the lattice, as identified by X-ray diffraction patterns, Fourier transform infrared spectroscopy and Raman spectroscopy, respectively. The field emission scanning electron microscope and transmission electron microscope revealed a particle system composed of irregular spherical-like microcrystals. The presence of Cu as well as its real amount in the samples were confirmed by means of X-ray photoelectron spectroscopy and inductively coupled plasma-atomic emission spectrometry, respectively. On increasing Cu level, a slight variation was noted on the photocatalytic activity of Ag_{3-2x}Cu_xPO₄ powders for degradation of rhodamine B under visible light irradiation. A photodegradation mechanism was proposed in details. The

Download English Version:

https://daneshyari.com/en/article/7835140

Download Persian Version:

https://daneshyari.com/article/7835140

Daneshyari.com