X Encontro da SBPMat

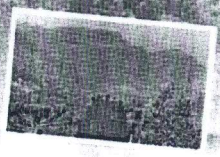
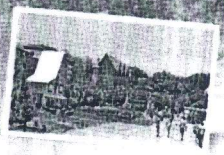
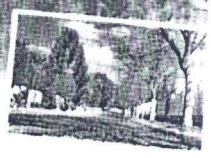
Gramado-RS

25 to 29 | september 2011

SBPMat Brazil-MRS

Brazilian Materials Research Society

X Brazilian MRS Meeting

16 symposia with oral, poster and invited lecture presentations

Plenary lectures

Exhibits

Celebration of 10 years of Brazilian MRS

Conference Details and Registration

All attendees are encouraged to visit the conference website http://www.sbpmat.org.br/x-meeting for further and updated information such as registration, submission of abstracts, important links for traveling (visas, travel agencies) and hotel reservation.

Symposia

A) Magnetic and Superconducting Materials

B) Biodegradable Polymer Materials

C) Electronic Materials

D) Surface Engineering: Fabrication, Characterization, Properties and Applications of Protective Coatings and Modified Surfaces

E) Materials with Negative Properties

F) Nanostructured Functional Materials for Advanced Energy and Environmental Applications

G) Molecular Modeling Materials Science

H) Structure-property Relationship of Advanced Metallic Materials

I) Sol-gel Route to Prepare New Inorganic, Hybrid and Multifunctional Materials

J) Solidification of Metals and Alloys

K) Supramomolecular Organic Materials for Electronic, Photonics and Nanotechnology

L) Structure-Property Relationship of Ceramic Materials: Theoretical and Experimental Aspects

M) Advances and Applications of Electron Microscopy

Prospects for Materials Science with Synchrotron Radiation in Brazil

1st Brazilian Symposium in Friction Stir Welding and Processing

Graphene

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10 years of excellence in the congregation of science and research in materials technology in Brazil

Contact

Secretariat
x-meeting@sbpmat.org.br
(55) (51) 3231-0311

Conference Chairs

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Important Dates

April, 5th - Registrations open
May, 30th - Submissions deadline
June, 13th - Acceptance

Support

UFRGS Universidade Federal do Rio Grande do Sul

CAPES

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Credit of photos: Leonid Strelian

Vanadium pentoxide nanostructures: optical properties and visible-light phocatalytic performance

W. Avansi.[1], V.R. de Mendonça[2], L.J.Q Maia[3], C. Ribeiro[4], E. Longo[1] and V. R. Mastelaro[5]
[1]*LIEC – IQ/Unesp , Universidade Estadual Paulista, Araraquara, SP, Brasil.*
[2]*DQ/UFSCar, Universidade Federal de São Carlos, São Carlos, SP, Brasil.*
[3]*Grupo Física de Materiais – Instituto de Física – UFG, , Goiânia, GO, Brazil.*
[4]*Embrapa, Empresa Brasileira de Pesquisas Agropecuárias, São Carlos, SP, Brasil.*
[5]*Instituto de Física de São Carlos, Universidade de S. Paulo, São Carlos, SP, Brasil.*

In the last decades, one-dimensional (1D) nanostructured materials, like nanowires, nanoribbon, and nanotubes have attracted the interest of many researchers due their improved properties when compared to similar isotropic structures [1-2]. Vanadium pentoxide (V_2O_5) 1D-nanostructures as nanowires and nanorods have been obtained by decomposition of vanadium peroxide in hydrothermal conditions [3]. The synthesis of $V_2O_5{\cdot}nH_2O$ nanostructures obtained in hydrothermal conditions was described in greater detail in ref. 3. The optical properties and its relation to the photocatalytic performance of the as-obtained samples were investigated. The optical properties of the as-obtained samples were studied by photoluminescence (PL) spectroscopy and UV-vis diffuse reflectance spectra (UV-vis DRS). The studied samples present a visible light emission at room temperature showing a PL with a broad emission between 550 and 800 nm. The UV-vis DRS allow us to infer that the observed visible light emissions should not be caused by the band edge transition, estimated around 2.4eV. Additionally, the local structure of these nanostructures was studied by Raman spectroscopy and X-ray Absorption spectroscopy (XAS). XAS and Raman results shows that the as-obtained V_2O_5 1D nanostructures presents a higher local order of V-O coordination sphere than V_2O_5 microstructures, where these local order depends of morphology of the as-obtained nanostructures. Also, the XAS and Raman results suggest that the observed difference in PL intensity may be related to the local order of V-O coordination sphere. V_2O_5 1D nanostructures showed high photocatalytic activity, which was demonstrated by degradation of methylene blue (MB) solution under visible-light irradiation ($\lambda > 420$ nm).
Keywords: vanadium pentoxide, hydrothermal synthesis, photocatalytic activity, luminescence.

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[1] X. Wang and Y. Li, *Inorganic Chemistry* **45** (2006), p. 7522.
[2] L. Cademartiri and G. A. Ozin, *Advanced Materials* **21** (2009), p. 1013.
[3] W. Avansi, C. Ribeiro, E. R. Leite and V. R. Mastelaro, *Crystal Growth & Design* **9** (2009), p. 3626.

e-mail:w_avansi@ifsc.usp.br