X Encontro da SBPMat

Gramado-RS

25 to 29 | september 2011

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

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Conference Chairs

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Important Dates

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

Support

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Development of sensor chamber to detect ethanol vapor in SnO_2 thin films

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Sensors based on ceramic oxides, especially SnO_2, are stable, working at various temperatures and can act as a sensor for various types of gases, among them alcohol derivatives [1]. It can be an interesting for the quality control of products based on these substances. The objective of this work is to obtain nanostructured SnO_2 thin films, produced by spin coating deposition from polymeric precursor solutions, applied as ethanol sensor [2]. After thermal treatment the films were characterized by X-ray diffraction (XRD) and field emission gun scanning electron microscopy (FEG-SEM). The films present cassiterite crystalline phase, homogeneous surface and grain size around 20 nm. Coupled with this study, was proposed a sensing chamber based on N_2 saturation with ethanol, which small area and allows they use with variation of temperature, time and concentration of gases. The SnO_2 films were submitted to N_2 saturated with ethanol in a flow from 40 mL/min to 300mL/min and the temperature of chamber was varied to 50 a 250°C. Being the first test realized, higher sensitivity was observed in 200°C at 100mL/min flux (Figure 1). Besides, adsorption and desorption were analyzed and the results show that film present hysteresis due to increase the resistance when the flow was variated from 300 → 40 mL/min, the second and third test respectively. The hysteresis and increase the resistance occurs probably due to surface poisoning, that may be originated based in structural characteristics of films, such as, vacances and porous. So, these results are evidency that a sensing chamber shows a good operation, since it can detect satisfactorily electrical responses through variation of temperature and ethanol flow. Finally, strategies to improve the intrinsic properties of SnO_2 films, such as utilization of dopants or a flux of air, are under study and will be the topic of future works.

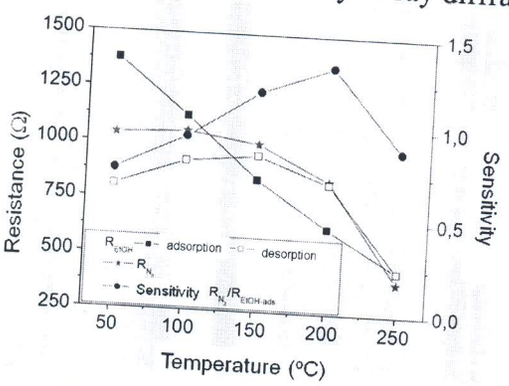

Figure 1. Resistance and sensitivity in function of temperature.

Keywords: sensor, ethanol, tin oxide.

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