J Material Sci Eng 2016, 5:7 (Suppl)
http://dx.doi.org/10.4172/2169-0022.C1.047

6th International Conference and Exhibition on
Materials Science and Engineering
September 12-14, 2016 Atlanta, USA

Nanocrystalline Cu_2O/p-Si solar light-responsive Schottky photodiode

A A Hendi
King Abdulaziz University, Saudi Arabia

Nanocrystalline of Cu_2O thin film was synthesized by sol-gel spin-coating technique. The spectrophotometric characteristics of transmission and reflection were studied for the film deposited on glass substrate. The optical absorption measurements near the absorption edge indicate that the absorption mechanism is due to allowed direct transition with energy gap value of 2.09 eV. The current-voltage characteristics of Al/Cu_2O/p-Si/Al diode were studied under dark and various light intensities in the range 20-100 mW/cm^2. The main diode parameters such as barrier height, ideality factor, series resistance were calculated from the analysis of current-voltage characteristics and studied under various illumination intensities. Moreover, the results indicate that the diode has a high photoresponsivity and the photocurrent increases with increasing light intensity which supports the availability of the diode for photosensor applications. The capacitance and conductance characteristics indicate that the diode highly depends on both voltage and frequency. Higher increase in the capacitance under low frequency as well as the presence of a characteristic peak in the capacitance-frequency characteristics indicates the presence of interface states. Moreover, the stronger parameters of the diode performance such as series resistance and interface states were extracted from the capacitance-voltage-frequency and conductance-voltage-frequency characteristics.

dr.asmahendi@hotmail.com

Microwave treating effects on a nanolaminated Nb2GeC compound

Ausdinir D Bortolozo, Rodrigo J Contieri, Giovana S Padilha and **Wislei R R Osorio**
University of Campinas, Brazil

The microwave and conventional heat treatments are used in order to sinter the Nb2GeC phase. XRD, SEM, density and hardness analyses are also discussed. The experimental results of XRD during 48 h by using the microwave heating revealed of about 90% v for the Nb2GeC phase, while the conventional heat treating has taken of about 240 h to attain similar results. From the economical and feasibility point of view, the microwave heating decreases the working or processing time. Rietveld refinement shows that the Nb2GeC compound belongs to the P63/mmc space group with a and c lattice parameters, as a = 0.323±0.005 nm and c = 1.256±0.005 nm. Based on typical SEM observations, it is also found that finer grains are provided when the microwave heating is applied. Additionally, a lower porosity is also attained when the samples are sintered using the microwave than the conventional process. The data of hardness measurements show the 545 MPa and 817 MPa to microwave and conventional heating. These results have indicated the high potential of microwave heating to produce MAX phases in shorter processing times than for conventional processing routes.

ausdinir.bortolozo@fca.unicamp.br