Journal of Tissue Science and Engineering
ISSN 0976-8505
2020
Vol.11 No.3

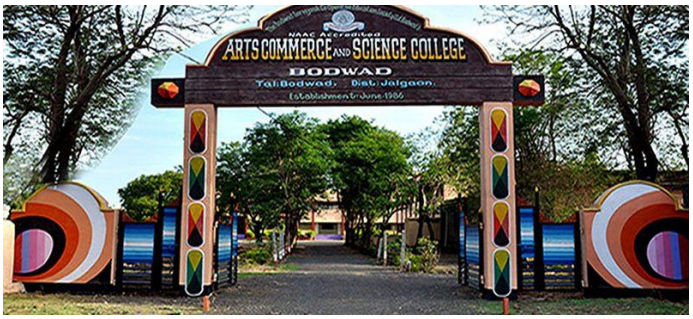
Synthesis, characterizations of nano ZnO powder and their potential use as thick film chemical sensor

Anil Ramdas Bari

Commerce and Science College, India

Abstract

Nanocrystalline ZnO powders were synthesized using ultrasonic atomization technique. Effect of precursor concentration, pyrolysis temperature and aerosol carriers on ultrasonically atomized nanocrystalline ZnO powders were studied. The powders were characterized using X-ray diffraction (XRD), transmission electron microscopy (TEM), selective area electron diffraction (SAED), absorption spectroscopy (UV-vis) and photoluminescence (PL). It was observed from XRD and TEM that the powder consisted of nanocrystallites with sizes less than 20 nm. The nanocrystalline ZnO powder showed that crystallite sizes were observed to increase with an increase in the concentration of solution and pyrolysis temperature. The influence of air and oxygen on crystallite morphology was studied using TEM. It was confirmed from TEM analysis that the crystallites were nearly spherical in powder prepared in the presence of compressed air. In the presence of pure oxygen, the crystallites could acquire regular hexagonal shape. The effect of precursor concentration, pyrolysis temperature and aerosol carriers on crystallite size and morphology of nanocrystalline ZnO powders is reported in the present study. Furthermore this nanocrystalline ZnO powder is used to prepared thick films using screen-printing techniques. Thick film is used as sensor to test the conventional gas and simulant of highly toxic chemical warfare agents (CWAs). The thick film sensor gives maximum response to Ammonia (conventional gas) and DMMP (simulant of CWAs).



Biography:

Dr. Anil Ramdas Bari has completed his PhD at the age of 30 years from Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon. He is the Head of Department of Physic, IQAC / NAAC Coordinator and NSS Programme Officer of Arts, Commerce and Science College, Bodwad. He has published more than 47 papers in reputed journals and presented more than 80 research papers in seminars, conferences and workshops. He attained more than 60 online webinars. He has been serving as an editorial board member of reputed journals. He has participated as an Organizing Committee Member in the Scientific Committee of 17 conferences and associations as well as served as a reviewer in a wide range of National and International Journals. He has chaired the sessions of the International Conferences and member of various scientific societies. His Scopus *h*-index is 11, Google Scholar *h*-index is 16 and Google Scholar *i10*-index is 20. He is an Executive Member of the Board of Studies, Maharashtra State Bureau of Textbook Production and Curriculum Research (Balbharti), Pune.

Speaker Publications:

6th Euroscicon Conference on Nanotechnology July 30, 2020, Online Event

Abstract Citation:

Anil Ramdas Bari, Synthesis, characterizations of nano ZnO powder and their potential use as thick film chemical sensor, 6th Euroscicon Conference on Nanotechnology July 30, 2020, Online Event