



SYNTHESIS OF NANOSTRUCTURED ZrO_2 FOR GAS SENSING APPLICATION

Pratap G. Patil¹, D. D. Kajale², V. P. Patil³, G. E. Patil² and G. H. Jain^{2*}

¹ Department of Physics, Ramnarain Ruia College, Matunga, Mumbai, India

² Materials Research Lab., K.T.H.M. College, Nashik 422 002, India

³ Department of Physics, BHAVAN's College, Mumbai 400 058, India

Corresponding Author: gotanjain@rediffmail.com

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Abstract- Nanocrystalline ZrO_2 (Zirconia) has been synthesized by a conventional precipitation method. The structural, morphological, microstructural, optical and gas-sensing properties of ZrO_2 were investigated by using X-ray diffraction analysis (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), UV-vis spectroscopy and static gas sensing unit, respectively. X-ray diffraction pattern and TEM of the synthesized product reveal their nanocrystalline nature with grain size 18 nm and 20 nm, respectively. Gas sensing properties of their thick films, which were fabricated by screen-printing to various gases (O_2 , NO_2 , C_2H_5OH , CO , CO_2 , NH_3 , LPG, H_2S and H_2) were tested in ambient air. The ZrO_2 thick films showed a high response and selectivity to H_2S gas. The effect of operating temperature, gas concentration on the sensing characteristics of these films towards H_2S was discussed..

Index terms: zirconia nanopowder, conventional precipitation method, characterization, H_2S sensor.