SYNTHESIS AND PHASE IDENTIFICATION OF METAL OXIDES

Alabi, Aderemi Babatunde [1], Taiwo, Olabode Anthony[2], Fajimi, G.R.[2] and Akomolafe Taiye[1]

[1] Department of Physics, University of Ilorin, Ilorin, Nigeria.

[2]Ladoke Akintola University, Ogbomoso, Nigeria

ABSTRACT

Copper (II) Oxide (Tenorite) nanostructured particles and thin film were prepared by chemical route technique. The XRD pattern obtained reveals crystallinity with major peaks at 2θ values 35.56°, 38.76°, 48.73° and 35.23°, 38.37° for the particles and thin film respectively, corresponding to database 2θ values of JCPDS card No. 48-1548, exhibiting cupric phase of the material with monoclinic lattice system. The average grain size of the particles was estimated using Scherrer formular to be 25.79 nm. The structural properties of Zinc Oxide prepared chemically at low temperature 60 ◌ was characterized with XRD with 2θ value range between 20 and 80°. Diffraction peaks in the pattern obtained are easily indexed to the Zinc Oxide hexagonal crystal structure and are in good agreement with the database 2θ values of ZnO with lattice constant plane oriented in the direction (101). The mean grain size of ZnO was estimated to be approximately 18.2 nm. Biosynthesis route of preparing ZnO using local plant leaves resulted in ZnO nanostructures with 2θ values at 31.64, 34.52, 36.38, 56.60 and 62.77 , confirmed using JCPDS card number 36-1451. The SEM image shows the hexagonal structure as revealed by the XRD result.

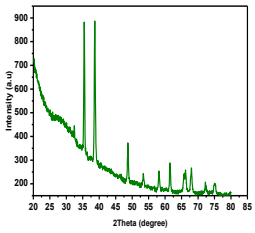


Fig.1: XRD Pattern of the Copper (II) Oxide Particle

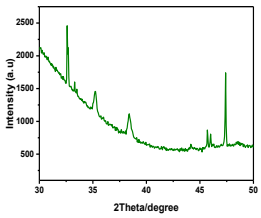
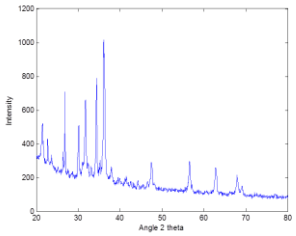


Fig. 2: XRD Pattern of Copper (II) Oxide Thin Film on glass substrate



RD

Fig. 3: XRD pattern of ZnO nanoparticles synthesized at a low temperature

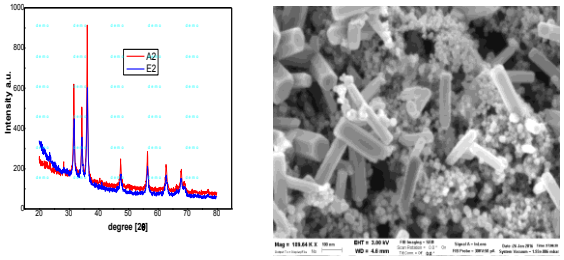


Fig 4.: XRD pattern and SEM image of Biosynthesized ZnO Nanostructures