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Study the Structural and Electrical Properties of PbO Thin Films Deposited by Chemical Spray Pyrolysis Technique

Abdulazeez O. Mousa*, Ali F. Marmoss

Department of Physics, College of Science, University of Babylon, P.O. Box 4,
Babylon, Iraq

Abstract:Chemical spray pyrolysis(CSP) method has been successfully employed for the deposition of nanocrystalline lead oxide (PbO) thin films. The films changes in the structural, topographical, and electrical properties were studied. The structural properties of (PbO) films were studied by means of X-ray diffraction (XRD) and atomic force microscopy (AFM). XRD analysis shows that all the films are polycrystalline in the tetragonal phase and present a random orientation. Surface topography of the lead oxide film consists of nanocrystalline grains with uniform coverage of the substrate surface with randomly oriented topography. The electrical measurements such as the Hall effect and D.C conductivity for all films. The results showed that (PbO) has conductivity about of $[5.17 \times 10^{-6} (\Omega \cdot \text{cm})^{-1}]$ at room temperature, and this conductivity increased with increasing of thickness, as well as the results showed throughout the study that all films have two activation energy and this energy increase with increasing of thickness.

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