STUDY OF ELECTRICAL AND OPTICAL PROPERTIES OF SEMICONDUCTOR MATERIALS CD (TEX, S1-X) MASSIVE PREPARATION PRODUCTS WITH BRIDGMANN TECHNIQUES AND TYPICAL VACUUM LAYERS FOR APPLICATION OF TYPICAL VACUUM SURVEYS.

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ABSTRACT

This study specifically aims to determine how the influence of Telerium (Te) atoms on CdS semiconductor materials. This effect can be identified by preparing and characterizing the Cd (Te_x S_{1-x}) semiconductor material with x = 0, 0.2, 0.4, 0.5, 0.6, 0.8 and 1.0, in massive form. and a thin films.
The Cd(Te_x S_{1-x}) massive alloy preparation was carried out using the Bridgman technique, while the thin film preparation used the vacuum evaporation technique. In the Bridgman technique, the mass of each material is calculated based on the molarity ratio of the alloy, then the materials are heated in a vacuum beyond their respective melting points. The massive material is then continued in the form of a thin layer by means of a vacuum evaporation technique. This technique is heating the alloy on the plate to its vapor temperature and is carried out in a vacuum. Furthermore, the preparation results were characterized to determine the crystal structure using X-Ray Difraction (XRD), chemical composition using Energy Dispersive Spectroscopy (EDS), surface morphology with Scanning Electron Micoscope (SEM) both on massive and thin layers. Further characterization for the thin film includes optical properties, namely the band gap width of each sample is determined by UV-VIS Spectroscopy and the electrical properties are known by the Four Point Probe (FPP) technique and the Hall effect.
The characterization results will produce how the structure and lattice constants (a, b and c) of the crystals, the chemical composition of the preparation results, the surface morphology so that it can be seen how the grain size occurs, the type / size of conductivity and the band gap width (Eg) as a function. of the x atomic fraction of the Telerium (Te) semiconductor alloy Cd (Te_x S_{1-x}). Information on these two physical quantities is indispensable in the application of materials in technology such as solar cells. Therefore, this research is a basic research to determine the structure, optical and electrical properties of Cd(Te_x,S_{1-x}) semiconductor

Kata Kunci: *Bridgman Technique, Vacuum Evaporation, Bandgap, Cd (Te, S)*