

# **Characterization of Crystal Structure, Chemical Composition and Optical Properties of PbTe and PbSe Chalcogenides for Applications in Sensor Technology**

**by Ariswan, Rita Prasetyawati, Warsono, Pinaka Elda Swastika, S.Pd., M.Sc.**

## **ABSTRACT**

A thin layer of lead telluride PbTe and Lead selenide (PbSe) has been prepared, then characterization was carried out to determine the structure and parameters of the crystals. Furthermore, it will be known whether the preparation results produce PbTe and PbSe phases by knowing the chemical composition and morphology of the material's surface. The nature and type of electrical conductivity and its response to temperature. Finally, it will be determined how much the material bandgap is so that it can be known the application of these materials in technology. Preparation of PbTe and PbSe thin films using vacuum evaporation and to determine material characterization using XRD to determine crystal structure and parameters, Scanning electron microscopy is integrated with Energy Dispersive of X Ray Analysis (EDX. ) and UV-VIS-NIR spectroscopy to determine the bandgap material. The results show that PbTe and PbSe both have a Face Center Cubic structure. The conductivity type is N type and has a bandgap of 0.26 eV for PbSe and 0.34 eV for PbTe.

Kata Kunci: *Key word: Chalcogenide, Lead telluride , lead selenide*