ABSTRACT

Photodetector is a device to detect light through a process of light converting into electricity. The most well known material for photodetector is Silicon. However, silicon is not sensitive to the visible light spectrum and has a quite low efficiency due to its indirect bandgap. In this study, we has built a prototype of photodetectors using Bulk Molybdenum disulphide (MoS_2) which has been predicted to be sensitive to visible light. For comparison, a prototype of silicon-based photodetector is also made to study the characteristics of photodetector prototypes based material that are already widely known. The silicon based photodetector prototype are able to measure the light intensity in the range of 0 -1000 W/m^2 with 1 W/m^2 resolution. It has average error of ± 0.3 W/m^2 compared to Solarmeter 10.0 with the highest responsivity and efficiency of 652 nm. For MoS_2 based photodetector prototype, the 1 W/m^2 resolution is applied for intensity 0 – 200 W/m^2 with ± 0.7 W/m^2 average of error compared to Solarmeter 10.0. The resolution of MoS_2 based photodetector prototype decreases 5 W/m^2 at intensity range of 200 - 1000 W/m^2 with ± 1.7 W/m^2 average of error compared to Solarmeter 10.0. MoS_2 based photodetector prototype has highest responsivity and efficiency of 406 nm. Both photodetector have a fast response with a period of 3 seconds.

Keyword**:** *Photodetector, Molybdenum disulphide, Light, Intensity of Light*