Al-doped CdS used as light detector

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Abstract. Solar radiation, particularly ultraviolet light, can have both positive and negative effects in different fields. Cadmium sulphide is a sensitive material commonly used in the manufacturing of solar panels. This material has potential for usage as light sensors due to its ability to convert solar energy into electricity.

This article examines a CdS dopped with Al sample, that was acquired using the chemical bath deposition. EDS-SEM was used to assess the sample's chemical composition. The sample's morphology was examined using SEM. The wavelengths at which the response to light was examined were 280, 370, and 443 nm. These were chosen so that the R2 would be as near to 1 as possible, enabling an accurate comparison of the sample reaction at various wavelengths. At every wavelength under investigation, the sample displayed a noticeable current response.

*Introduction***.** Cadmium sulphide is a group II-IV semiconductor with the forbidden band 2.42eV. Cadmium sulfide is widely used in the fabrication of solar panels due to its good absorption of solar energy and subsequent conversion to electricity [1].

The use of a material for doping CdS can help to improve the electro-optical properties and as an expected result it will be possible to use these samples in detectors with fast response to external excitons such as UV radiation [2]. In previously published work is characterized some samples that have been doped with Al, to obtain in result decrease in electrical resistance, increase in charge carrier density and sensitization of the sample, which could in the perspective could beneficially influence the sample for further use as UV sensor [3, 4].

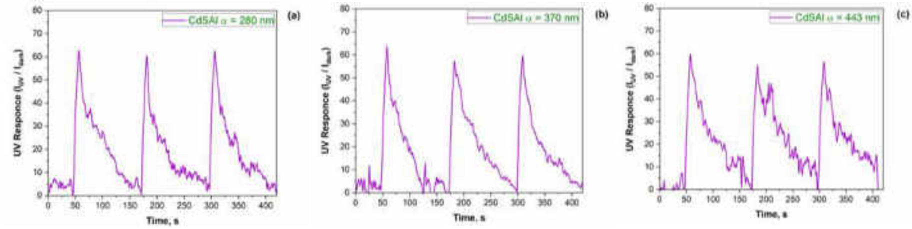

Fig. 2. Response of Al-doped CdS sample at 280, 370 and 443 nm.

For this research, 3 light sources are used, mainly in the ultraviolet range, with wavelengths equal to 280, 370 and 443 nm respectively. Figure 2 provides pronounced responses at all wavelengths.

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