

# CdTe thin films for Solar Cells Application Prepared by Close-Spaced Sublimation and Magnetron Sputtering Methods

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Cadmium telluride became one of the most promising materials for its potential applications in solar energy technology since last decades. A lot of methods for preparing CdTe thin films had been reported [1]. The electrical, optical and structural properties of the films can change depending on preparation method and conditions. Our interest lies in taking advantage of the benefits offered by various methods to make films with desired properties.

This work presents comparison of XRD, atomic force microscopy, confocal Raman spectroscopy, and photoluminescence data's for two series CdTe thin films deposited on glass substrates by close space sublimation (CSS) and magnetron sputtering methods.

CSS-deposited CdTe thin films crystallized in the cubic sphalerite structure (space group F43m) with  $a=6485\text{\AA}$  and showed a preferential orientation along the [111] direction. The films consist of grains 2–6 $\mu\text{m}$  in size (Fig. 1a) and are dense. Grain sizes of magnetron sputtered films are smaller (around 1 $\mu\text{m}$ , Fig. 1b) and are oriented mainly in [311] direction. The intensities of photoluminescence and Raman emission of CSS films are much higher than that of magnetron sputtered films.

The difference between the results for CSS-deposited and magnetron sputtered CdTe films are discussed in terms of the fact that CSS films are deposited at a much higher temperature (620°C versus 200–300°C) and therefore contain a lower concentration of structural defects [2].

**Keywords** cadmium telluride; close-spaced sublimation; magnetron sputtering

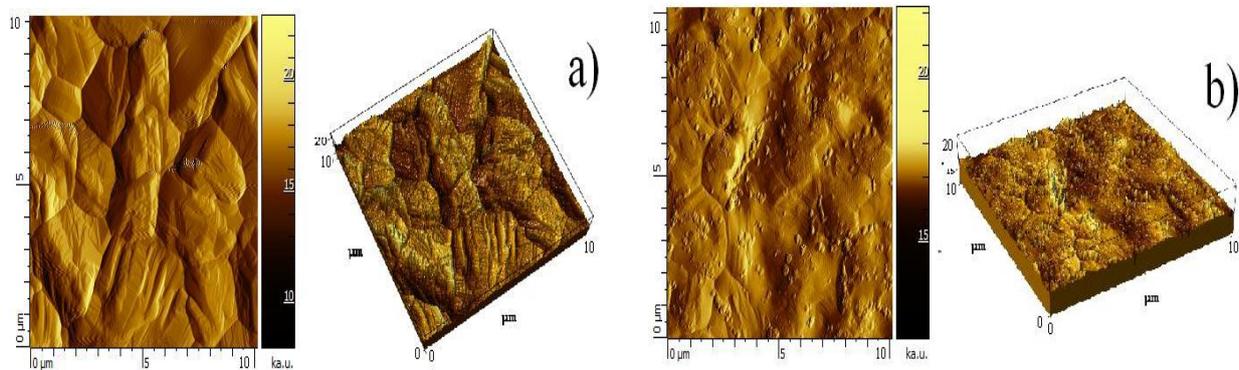


Figure 1. AFM images of CSS deposited (a) and Magnetron sputtered (b) films

## References

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