

X-Ray Analysis and Grain Size of CuIn_x Ga_{1-x} Se₂ Solar Cells

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Abstract : Polycrystalline Cu In 1-x GaxSe₂ thin films have been fabricated. Some physical properties such as lattice parameters, crystal structure and microstructure of Cu In 1-x GaxSe₂ were determined using X-ray diffractometry and scanning electron microscopy. X-ray diffraction analysis showed that the films with $x \geq 0.5$ have a chalcopyrite structure and the films with $x \leq 0.5$ have a zinc blende structure. The lattice parameters were found to vary linearly with composition over a wide range from $x = 0$ to $x = 1.0$. The variation of lattice parameters with composition was found to obey Vegard's law. The variation of the c/a with composition was also linear. The quality of a wide range of Cu In 1-xGaxSe₂ thin film absorbers from CuInSe to CuGaSe was evaluated by Photoluminescence (PL) measurements.

Keywords : grain size, polycrystalline, solar cells, lattice parameters

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