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Selenization of CIG Precursors Using RTP Method with Se Cracker Cell

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The CIGS absorber has outstanding advantages in the absorption coefficient and conversation efficiency. The CIGS thin film solar cells have been researched for commercialization and increasing the conversion efficiency. CIG precursors were deposited on the Mo coated glass substrate by magnetron sputtering with multilayer structure, which is CuIn/CuGa/CuIn/CuGa. Then, the metallic precursors were selenized under high Se pressure by RTP method which included. Se vapor was supplied using Se cracker cell instead of toxic hydrogen selenide gas. Se beam flux was controlled by variable reservoir zone (R-zone) temperature during selenization process. Cracked Se source reacted with CIG precursors in a small quantity of Se because of small size molecules with high activation energy. The CIGS thin films were studied by FESEM, EDX, and XRD. The CIGS solar cell was also developed by layering of CdS and ZnO layers. And the conversion efficiency of the CIGS solar cell was characterization. It was reached at 6.99% without AR layer.

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