Variation with the deposition rate of cadmium sulfide for CIGS solar cell

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CuIn₁₋ₓGaₓSe₂ (CIGS) has been considered as one of the best candidates in opto-electronic devices with high-conversion efficiency. CIGS solar cells can be manufactured on the flexible substrates which have an advantage to adopt various applications like Building-Integrated Photovoltaic (BIPV). In order to apply the solar cells deposited on the flexible substrates to industrial fields e.g. BIPV, it should be essential to develop the methodology and investigation for the uniformity of scale-up CIGS solar cell.

In this study, the variation of constant temperature with the deposition rate of cadmium sulfide was studied with constant temperature 70°C and 65°C. CIGS thin film solar cells on Mo-deposited sputtering system were fabricated using co-evaporation system by the 3 stage process on the substrates. After deposition of CIGS absorption layer (50X50 mm² sub-module scale), the buffer layer of about 50nm CdS(O, OH) is deposited by Chemical bath deposition (CBD) method with constant temperature 70°C and 65°C. Optical and electrical analysis was performed using Time-Resolved Photo luminescence (TRPL) system which is to have an advantage of non-destructive inspection to investigate carrier-lifetime uniformity of the thin films for large area CIGS thin film solar cells.