

# Electroreflectance Study of CIGS Thin Film Solar Cells

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We have investigated the optical and electrical properties of the CIGS thin film solar cells by the electroreflectance (ER), photorelectance (PR), photoluminescence (PL), and photocurrent (PC) spectroscopies at room temperature. The ER spectrum had two narrow signal regions and one broad signal region. We measured PL and PC to confirm the signals at low energy region (1.02~1.35 eV), so these signals are related to the CIGS thin film, and the high energy region (2.10~2.52 eV) is related to the CdS bandgap energy. The broad signal region (1.35~2.09 eV) is due to the internal electric field by the p-n junction from the comparison between PR and ER spectra, and we calculated the internal electric field by the p-n junction. In the high efficiency solar cell, the CdS signal of ER spectrum is narrower than the lower efficiency solar cells.

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