



Alternative Window Schemes for CuInSe₂-Based Solar Cells: Final Report (Paperback)

By National Renewable Energy Laboratory (NREL)

Bibliogov, United States, 2012. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.This work demonstrated high-efficiency CIGS cells based on highly resistive ZnO buffer layers grown by MOCVD. One cell based on NREL CIGS and a ZnO buffer layer exhibited an active-area efficiency of nearly 14 percent. This result is one of the best efficiencies reported for a direct ZnO/CIGS cell made with a vacuum process. This work has established that the buffer layer is truly ZnO and not an alloy resulting from interdiffusion of ZnO and CIGS. Also established is that a two-step growth procedure like those described as baseline and modified lead to efficient cells. To achieve high efficiencies, ZnO buffer layers must have resistivities greater than 10^4 ohm-cm. Efficient cells are obtained whether the high resistivity is achieved as-grown, or after exposure to air. Because cell efficiencies are lower than predicted by simulation studies when the buffer resistivity is lower than 10^4 ohm-cm, we conclude that the resistivity is simply related to processing. In particular, the resistivity correlates with the excess zinc in the MOCVD ZnO film, which can, in turn, diffuse into the CIS...



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