Fabrications of copper oxide based heterojunction thin film solar cell by using sputtering

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In this study, we have fabricated p-typecopper oxide/n-type Si wafer heterojunction solar cell and measured theirconversion efficiency. The p-type CuO and Cu2O films were deposited by rfmagnetron sputtering method with various sputtering parameters such as, oxygenflow rates and working pressures, then the fabricated heterojunction solarcells were post-annealed in vacuum ambient with various temperatures [1-2]. Theelectrical, optical and structural properties of the fabricated copper oxidethin films were measured by various measurement equipments, and dark I-V andillumination I-V properties of fabricated p-type copper oxide/n-type Siheterojunction were measured by solar simulator and source-meter. As theresults, open circuit voltage, short current density, fill factor andconversion efficiency of p-CuO/n-Si heterojunction solar cell at 30 mTorr andexhibited 0.203V, 5.37mA/cm2, 39.82% and 0.43% Photovoltaic properties ofp-Cu2O/n-Si heterojunction solar cell at 30mTorr and 500ºC exhibited 0.279 V,2.39 mA/cm^2, Fill Factor 18.92% and 0.12% respectively.

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