

Surface Engineering in anti-reflecting component by metal oxide double layer coating for crystalline silicon solar cells

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This work describes the designing of double layer antireflection (AR) coating on crystalline Si solar cells and investigates their optical, structural and photovoltaic properties. For double AR layer deposition, ZnO and Ag-doped ZnO precursors were coated one by one via spin coating technique at 3000 rpm for 30s followed by annealing at 500 oC for 4 h. The double ZnO/Ag-doped ZnO AR layer on Si wafer shows the significant decrease in the average reflectance of ~7.13% in the wavelength range of 400-1000 nm. Whereas, single ZnO and Ag-doped ZnO AR layer on Si wafer shows low average reflectance of ~10.5% and 8.67% in the wavelength range of 400-1000 nm, respectively. The optimal double ZnO/Ag-doped ZnO AR on Si wafer with low reflectance and good surface properties can be a promising candidate for fabricating high performance Si solar cells with low cost.