ZnO and Ag-ZnO Antireflection Layer on Crystalline Silicon Solar Cells

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In this work, the low cost and effective antireflection (AR) materials were prepared by a simple sol-gel method and coated by spin coating technique over the silicon (Si) solar cells. Sol-gel synthesized zinc oxide (ZnO) and silver (Ag) doped ZnO precursors were used for the deposition of single AR layer using spin coating followed by annealing at 500oC for 2 h. Ag-ZnO AR layer on Si solar cell showed low average reflectance of 8.67% in the wavelength range of 400-1000 nm as compared with ZnO AR layer (Rav ~10.5%). Importantly, Ag-ZnO AR displayed good morphological behavior in terms of its uniformity, smoothness and low surface charge life time. The fabricated Si solar cells with ZnO and Ag-ZnO AR layers attained the reasonable photovoltaic properties as compared with commercial Si solar cells.