

Low temperature anti reflection coating on P-type silicon solar cell using nano size SiO₂/SiC nanocomposite

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The antireflection (AR) coating in fabrication of silicon solar cell is an important step to achieve the high performance and long term stable solar cells. In this work, SiO₂/SiC nanocomposite was prepared by low cost sol-gel process and utilized as AR materials for Si solar cells. The AR coating was performed in two steps: i) the sol-gel of precursor solution was coated on p-type Si-wafer by spin coating at 2000 rpm and ii) the coated wafer subjected to annealing at 500oC for 2 h. The crystalline properties revealed the formation of SiO₂/SiC nanocomposite as seen the phases of SiC along SiO₂. The SiO₂/SiC nanocomposite AR coating on Si wafer significantly decreased the reflectance as compared to without AR coated Si-wafer, suggesting the good antireflecting nature of the prepared SiO₂/SiC nanocomposite. The effect of AR coating with SiO₂/SiC nanocomposite will be discussed in terms of electrical parameters of p-type silicon solar cell and reflection losses.