Sputter-deposited low reflectance vanadium oxide-molybdenum oxide thin films on silicon

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Sputter-deposited low reflectance vanadium oxide-molybdenum oxide thin films on silicon

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Abstract

A single layer antireflective, smart, crystalline and nanocolumnar pulsed RF magnetron sputtered vanadium oxide-molybdenum oxide thin film on silicon is proposed for the alternate material for silicon based futuristic solar cell application. The VO-MO film with 130 nm thickness grown at 200 W shows significant low reflectance (1% within the 500-600 nm region). The VO-MO film with lowest reflectance shows a phase transition at around 55 °C which is beneficial due to film inherent variable IR emittance behaviour which may be helpful for eliminating excess heat load generated during in-service of silicon solar cell.

Keywords: *vanadium oxide-molybdenum oxide; thin films; low reflectance; sheet resistance; smart phase transition*

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