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A brief review of Antireflection Coating for Device Application

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Abstract: Anti Reflection Coatings Reflection Coating (ARC) reduce reflection losses and hence are essential for improvement of devices which rely on either transmission or absorption of light passing through it. ARC are thin films whose efficiency depends on two factors- their refractive index and thickness. Mathematical modelling based on Fresnel's law defines definite criteria for refractive index and thickness of ARC films. The refractive index should be an optical match between the incident medium and the substrate while the thickness should meet the criterion of quarter-wavelength condition.. Further improvement of ARC is possible by structural modification, where single layer, double layer or multilayer ARC of low and high refractive index are used to curb the reflection losses for a wider range on incident spectrum. The paper discusses in details, the mechanism behind antireflection properties, single layer, double layer or multilayer anti reflection coatings and the different materials used for making anti reflection coatings. Recent work on ARC have also been reviewed.

Keywords: Anti reflection coating, Quarter wavelength condition, Reflection losses, single layer antireflection coating, double layer anti reflection coating, multilayer antireflection coating.

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1. Introduction

When light is incident at the interface between two medium, there are three possible outcomes- reflection at the interface, transmission through the second medium and absorption of light as it passes through the second medium. Devices like solar cells whose performance depends on the amount of light absorbed, or on the amount of light transmitted like sensors and lens, reflection is equivalent to loss of