High performance broad band antireflective coatings for optical, solar and display applications

Overview

The constantly growing demand for optoelectronic and optical equipment in diverse areas, including consumer electronics and space exploration has created the need to identify the best ways to improve the efficiency of light collection. In this regard, development of broad-band anti-reflective coatings (BARCs) has attracted substantial research interest due to their high transmittance in a broad wavelength range (300–2500 nm). Due to their high refractive indices, optical elements like glass and polymeric transparent substrates suffer a reflection loss of about 8-9% in the visible spectrum of the solar radiation. Such reflection losses are undesirable and detrimental to the overall light to electricity conversion efficiency. Hence, BARCs that transfer maximum incident light over a broad range of wavelengths can help to achieve competitive conversion efficiencies in solar cells.

Key Features

- High transmittances in visible and solar regions: >98% (in visible) >96% (in solar)
- Low temperature curable (80-100 °C)
- High temperature stability: Max up to 1000 °C
- Weather stability: > 200hrs withstand in high humidity (>90%) at 50 °C
- High mechanical stability and Long durability
- Cost effective coating technique

Potential Applications

- Solar PV & CSP cover glass
- Optical lenses
- Video display panels
- Architectural glasses
- High power lasers

Major Patents/Publications


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*IPDI: Intellectual Property Development Indices