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Antireflection nanocomposite coating on PV panel to improve power at maximum power point

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ABSTRACT

A thorough investigation was performed on various chemicals and nanocomposite materials to apply antireflection coating on the PV panel intending to improve the solar cell efficiency by generating more voltage, current, and power at maximum power point (MPP). The improvement in solar cell efficiency would indicate the efficient way of utilizing solar energy and converting into electrical energy which in turn saves lot of cost and improves the power generation. To improve the efficiency by the coating approach, the nanocomposite materials mixing with some composition of efficient chemicals demonstrates extremely encouraging change in surface inactivity, antireflection, and wanted vitality band hole of the materials. After a

detailed experimentation, it is been identified that the multiwall carbon nanotube, titanium dioxide, and silicon dioxide materials demonstrate elevated efficiency in increasing the V_{MPP}, I_{MPP}, and P_{MPP} when compared with uncoated cells. The investigational inferences in detailed are analyzed along with scanning electron microscopy findings and finally characterized the poly-Si solar cell with coating. Overall, there is a relative improvement of 36.45% of efficiency when compared with the uncoated cells.

Q KEYWORDS: ARNCC   maximum power point   MWCNT   nanocomposites   poly-Si   power conversion efficiency

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Additional information

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