NANOTECHNOLOGY IN PV/SOLAR CELL

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Abstract

Due to powerful interest in renewable energy and the global climate change issue, the solar cell sector has risen rapidly in latest years. Potential advances in nanotechnology, however, may open the door to cheaper and slightly more effective solar cells being produced. PVs based on CdTe, CuInGaSe (CIGS), CuInSe (CIS) and organic materials are being created in order to reduce the cost per watt even if this implies sacrificing effectiveness and reliability in conversion. It would assist to maintain the environment by using nanotechnology in cheap solar cells.

Key words: Nanotechnology, PV/Solar cell, environment.

Introduction

There are two major drawbacks to conventional solar cells: efficiencies and their costly production costs. With silicon cells, the first drawback, inefficiency, is almost inevitable. Nano particles[1], [2] are tens of thousands of times lower motes of matter than a human hair's length. Due to the fact that the nano particles are tens of thousands of times lower motes of matter than a human hair's length. Because they are so tiny, a big proportion of the atoms of nano particles lie on their surfaces instead of their intestines.

Methodology

The Ultraviolet light[3] is either filtered out or absorbed by silicon and transformed into heat, not electricity, possibly harmful. It could pair and generate electricity effectively to properly sized nanoparticles. Integrating a high-quality movie of silicon nanoparticles, 1 nanometer of size straight into silicon solar cells increases the efficiency of the ultraviolet range spectrum[4] by 60%. The first step initiates with converting bulk silicon into discrete, nano-sized particles to create the enhanced solar cells. The nanoparticles will fluoresce in different colors depending on their size.

The required size nanoparticles were then distributed in isopropyl alcohol and dispensed to the solar cell's face. A film of tightly packed nanoparticles was left as the alcohol evaporated.

To reach an electrode, electrons produced in a solar cell based on nanoparticles must follow a circuitous route (red line). Many don't do it, reducing these cells ' effectiveness. Electrons produced when light is absorbed by titanium-oxide particles must jump from particle to particle in order to reach an electrode without the carbon nanotubes. Many never create an electrical current generated. The carbon nanotubes[5], [6] collect the electrons and give the electrode a more direct path, enhancing the solar cells ' effectiveness. With high current density capacity on the surface of the solar cell, the CNTs provide better electron ballistic transport property along its axis without much loss. The positioning of the CNT with the substratum of polymer composites gives very elevated photovoltaic conversion efficiency. The composites of polymers increase the contact area for better transfer of charge and conversion of energy. At the laboratory scale, the solar cell's efficiency is about 50% in this process. With the aligned CNTs with poly 3-octyl thiophene (P3OT) based PV cell, optimum performance was accomplished. Due to polymer-and nano-tubes junctions within the polymer matrix, P3OT has enhanced the property. High electrical field within the nano pipe divides the exciton into electrons and holes and allows quicker transmission of electrons with a higher quantity effectiveness of more than 50%.

Conclusion

The paper provided an embedded linear PM synchronous machine with a linear magnetic equipment for generating direct drive wave power. By carefully combining the linear magnetic equipment and the linear PM generator, the device can capture the slow reciprocating wave movement straight and take the high-speed generator design.

References

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