Process for Fabrication of Efficient Solar Cells

APPLICATION AREAS
Photovoltaics

ABSTRACT
Polymer-based photovoltaic devices have received intense interest in recent years because of their potential to provide low-cost solar energy conversion, flexibility, manufacturability, and light weight. However, the efficiency of organic solar cells is about 4-6%, and increasing this efficiency is critical for developing practical applications and commercially viable devices. One approach to increasing efficiency is to increase the light absorption on the organic film without increasing the thickness of the photoactive layer, and various light management techniques have been tried for enhancing optical absorption, such as collection mirrors, patterned substrates and microprism substrates. However, these approaches require extra processing steps or technically challenging coating technologies. To overcome these limitations, ISU and Ames Laboratory researchers have developed a process for conformal coating of polymer photovoltaic layers on microtextured substrates for increased light trapping. The light management architecture of these solar cells enables a high degree of light absorption in even very thin photoactive films and leads to improved power conversion efficiency.

BENEFITS
- Efficient (improves light absorption and power conversion)
- Economical (can be fabricated using low-cost and scalable soft lithography techniques)

REFERENCE

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Patent pending

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