

Recent advancements and challenges in flexible low temperature dye sensitised solar cells

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ABSTRACT

Dye sensitised solar cells (DSSCs) have been in extensive development in recent years in the field of solar energy due to its cost-effectiveness, ease in fabrication, flexibility, and being able to be transparent and coloured as well. Two broad categories of DSSCs based on their fabrication temperature are (1) high-temperature DSSCs and (2) low-temperature DSSCs. Although the low-temperature DSSCs (sintered at less than 150 °C) can be flexible and printed on a plastic roll, however, their power conversion efficiency (PCE) is way less compared to their high-temperature counterpart. Research is underway to improve the PCE of low-temperature DSSCs and modules to optimum levels. In this review, an attempt has been made to evaluate different materials and fabrication methods for improved performance of flexible low-temperature DSSCs while also comparing them with the usual rigid high temperature device. Another objective of this study is to critically discuss the progress being made in flexible module development. This review paper would be able to provide comprehensive summary of the recent developments of flexible low-temperature dye sensitised solar cells and modules for reference and also serve as guide for further research in this area.

KEYWORDS

Counter electrode; Flexible DSSCs; Low temperature; Photoanode; Plastic substrate

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