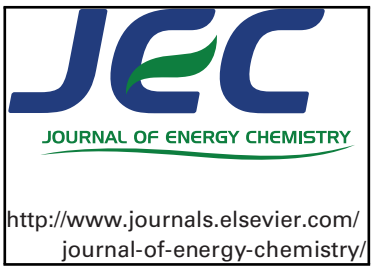

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Review

Recent advances of flexible perovskite solar cells

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Abstract

In few years only, the efficiency record of perovskite solar cells (PSCs) has raised quickly from 3.8% to over 22%. This emerging photovoltaic technology has primarily shown its great potential of industrialization. Flexible PSCs are thought to be one of the most priority options for mass production, related to the intrinsic advantage of perovskite thin films which could be deposited by facile solution processes at low temperature. Flexible PSCs have at least four advantages in comparison to the rigid counterpart: (1) it can generate higher power output at lighter weight, (2) it is easily portable, (3) it can be easily attached to architectures or textiles with diverse shapes, and (4) it is compatible with roll-to-roll fabrication in a large scale. In this review, we have summarized recent development of the key materials and technologies applied in flexible PSCs. The key materials including flexible substrates, transparent and conductive electrodes, and interfacial materials; some key technologies about roll-to-roll manufacture, encapsulation technology have been overviewed. Finally, a prospect on possible application directions of flexible PSCs have been discussed.

Keywords: Perovskite solar cell; Flexible solar cell; Low-temperature process; Roll-to-roll manufacture; Thin film encapsulation