

Flexible dye sensitized solar cell

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In this report, we present a highly flexible, efficient DSSC, fabricated by sewing textile-structured electrodes onto casual fabrics such as cotton, silk and felt, or paper, thereby forming core integrated DSSC structures. By carefully fabricating the woven electrodes, the sewing process, one of characteristics of textiles, can be applied to the fabrication of solar cells as well as to the process of weaving using a loom.

(a) Relationship between current density and applied voltage (red circle) and specific power and applied voltage (blue line) of a textile-based DSSC prepared by sewing the woven electrode onto Hanji; measurements were obtained under 1-Sun, 1.5-AM conditions. (b) Photographs showing a textile-based DSSC wrapped around a rod with a 4-mm radius of curvature under cyclic bending deformation (inset). (c) Relative energy conversion efficiency of the flat-state textile-based DSSC and (d) relative efficiency after cyclical bending of 1000 and 2000 times.



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