

Textile Based, Polyethylenedioxythiophene: Polystyrenesulphonate (PEDOT:PSS) Energy Storage Device

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These research aimed at developing an all textile energy storage device for smart textile applications. The energy supply/storage is an important component of a smart textile system. It provides the required energy to power the system. Current smart textile prototypes employ rigid, weighty batteries that come as detachable; this reduce the comfort of the wearable clothing. Thus there is need to make light weight energy storage device which are seamless with the textile structure. This should be done without compromising the comfort and other desirable aspects of the textile.

A textile based cell that is flexible, lightweight and well integrated into a fabric was developed. Cotton/polyester fabric, was used as the textile substrate, pure stainless steel filament yarns are used as yarn electrodes. An organic conductive polymer known as polyethylenedioxythiophene: polystyrenesulphonate (PEDOT:PSS) was used as the electrolyte. The yarn electrodes were inserted into textile substrate by sewing. The cells were charged mostly at a constant voltage of 1.5 V for 2 hours. After disconnecting the power source, the cell has some energy stored in it, but, they experience self-discharge owing to loss of the stored energy without any load connected to it. Overcoming the self-discharge of the cells would bring better results.

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