

Coaxial Fiber-Shaped Highly Flexible Li-ion Battery for Powering Textile Electronics

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The stimulating desires of energy storage at millimeter scales for wearable technologies and IoT raise persistently, driving the advancement of integrable micro-power sources that can be comprehended due to pioneering researches in the chemistry of materials, battery architectures, and microfabrication developments. At this point, we propose an innovative strategy in the family of flexible coaxial fibrous Li-ion batteries by effectively implementing the unidirectional helical winding technique to accomplish multilayered tubules of all the cell components. In addition, the coaxial fiber battery encompasses an exclusively designed separator from a spunbonded polypropylene delivers auspicious electrochemical properties. Such a coaxial fibrous Li-ion batteries device presenting high energy storage capability is millimeter thin, highly flexible, and functions efficiently without compromising the total electrochemical performance of the battery. The full cell delivers a specific capacity of 137 $\mu\text{Ah cm}^{-1}$ at a 0.1C rate with almost 100% coulombic efficiency and is more capable of being functioned at several charging rates. The co-axial fiber battery was then altered well along to a spiral shaped flexible battery with outstanding stretchability.

References

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