

Wide potential window, cheap, eco-friendly, wearable energy storage devices

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Abstract

We successfully fabricated 3D network VOx and MnOx on a conductive paper (PVA-acetamide-LiClO₄-graphite/paper, PGP) as electrodes linked with an eco-friendly and cost-effective PVA-Acetamide-LiClO₄ (PAL) ionic liquid-based gel electrolyte for wide potential window wearable asymmetric supercapacitor devices. These devices are able to work with a large operating voltage > 4.0 V, and supply outstanding energy and power density (>200 Wh/kg and >90 kW/kg). The devices demonstrate remarkable cycling stability and durability after 6000 cycles, including bending and twisting (capacitance retention > 90%). The devices demonstrate a great prospective candidate for wearable/flexible electronic devices and Internet of Things (IoT) applications.

Key word: wearable device, ionic liquid, supercapacitor