**Skin-conformable and stretchable supercapacitors with Janus vertical gold nanowires**

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As an essential part of wearable electronic system, wearable energy devices have drawn enormous attention in recent years. In order to achieve on-skin operation and power all the electronic components, the power supply system has to be thin, soft, stretchable and skin-conformable with high performances. Our group has developed Enokitake-like vertical gold nanowires (v-AuNWs) grown on polymer substrates that formed intrinsically stretchable conductive elastomers. A second skin-like multifunctional supercapacitor has been built based on v-AuNWs and polyaniline (PANI) with areal capacitance of 11.4 mF/cm2 (10 mV/s) and high durability. The electrodeposited PANI plays a dual role in enhancing capacitance and as charge/discharge-level indicator. The supercapacitor could also be patterned into conformable “tattoo” on human skin with negligible performance deterioration under multiple dynamic hand movements and skin deformations.1 In another work, by incorporating with photolithography technique, v-AuNWs are patterned into microelectrodes for stretchable micro-supercapacitors (MSCs). The Janus v-AuNWs can have their “enokitake head” or “enokitake tail” exposed to the electrolyte, leading to a head-exposed MSC (H-MSC) and a tail-exposed MSC (T-MSC) with distinct performances, respectively. Particularly, the T-MSC could also function under 110% of strain with negligible performance degradation.2

**References**

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