Highly Sensitive Semitransparent Wearable Sensors Using Oxide Nanomemberane hybrids

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In recent years, wearable electronics have drawn enormous attentions due to their promising possibilities in mobile devices and biomedical applications. As a good example, wearable electronic devices can collect electrophysiological data from the human skin during the people's daily lives, enabling remote monitoring of the patients with cardiac illnesses. Despite the dramatic improvements in the fabrication technique of such devices, up-to-date commercially available wearable electronics have fundamental limitations which originates from the use of rigid materials for stable and high performance. Thus, improvements in the materials choice and system design should be considered to minimize the fundamental constraints in geometrical and mechanical deviation between the skin and wearable devices. Here, we demonstrate materials and constructs design for ultrathin, semitransparent, and stretchable zinc oxide devices which can be conformably mounted onto biotic entities. Moreover, the use of nanomaterials (single wall nanotube and silver nanoparticle) significantly enhance sensitivities of these devices while maintaining the low thermal budget of the fabrication processes.