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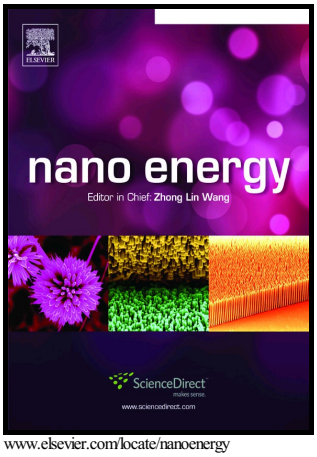

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All-in-one piezoresistive-sensing patch integrated with micro-supercapacitor

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Keywords: porous CNT-PDMS elastomer, piezoresistance sensor, micro-supercapacitor, pressure sensing, human machine interface.

Abstract

Portable and wearable sensors have attracted considerable attention, which could perceive and respond to ambient stimuli accurately. For the sake of solving the limited power supply and low integration, it is critical to develop and combine functional electronics with flexible energy devices. In this work, we designed an all-in-one sensing patch integrated with piezoresistance sensor and micro-supercapaitor with the porous CNT-PDMS elastomer. Taking the advantage of porous structure with piezoresistivity and elastomer with electrochemical performance, the piezoresistance sensor shows high sensitivity (0.51 kPa^{-1}) and wide detection range as functional fraction, and micro-supercapacitor maintains excellent areal capacitance and cycling stability after 6,000 cycles as energy storage fraction, respectively. Assembled with piezoresistance sensor and micro-supercapacitor, the sensing patch could be easily