Supplementary Information

Crack-based strain sensor with diverse metal film by inserting inter-layer

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Keywords: Strain sensor, Thin metal film, Spider inspired, Crack

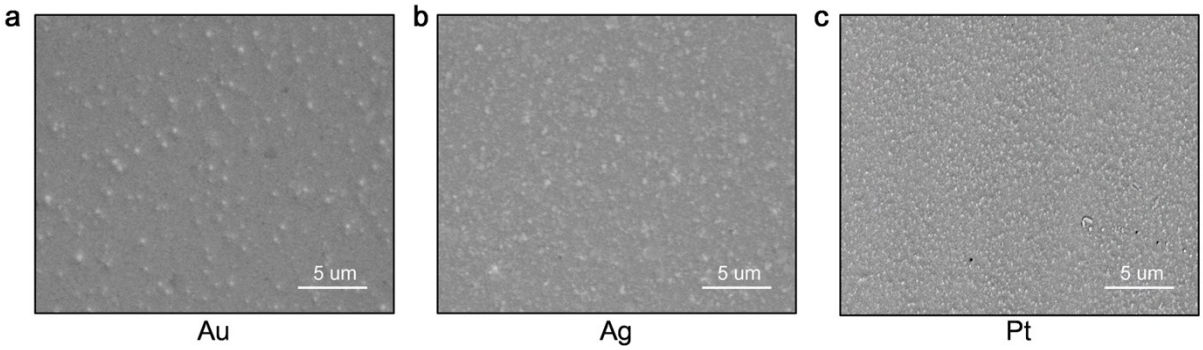

Figure S1. The SEM image of the conductive materials deposited on the PET substrates after applying strain of 2%. (a) Au deposited PET substrates after stretched strain of 2%. (b) Ag deposited PET substrates after stretched strain of 2%. (c) Pt deposited PET substrates after stretched strain of 2%.

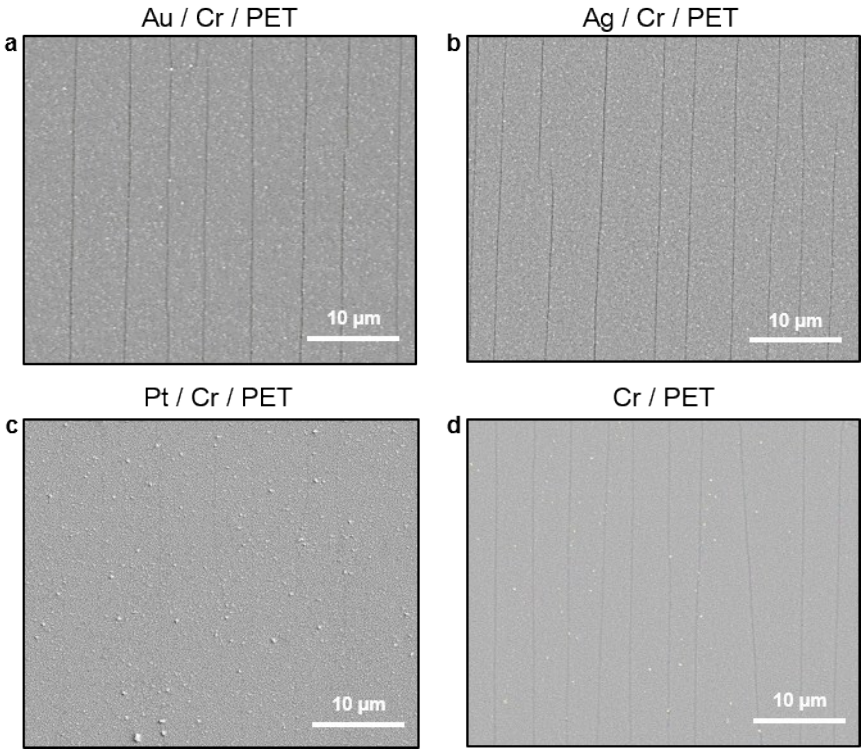

Figure S2. The FESEM image of Metal layered crack sensors without MoO3 layer after applying strain of 2%. (a) An Au and Cr deposited PET substrate. (b) An Ag and Cr deposited PET substrate. (c) A Pt and Cr deposited PET substrate. (d) Cr deposited PET substrate.

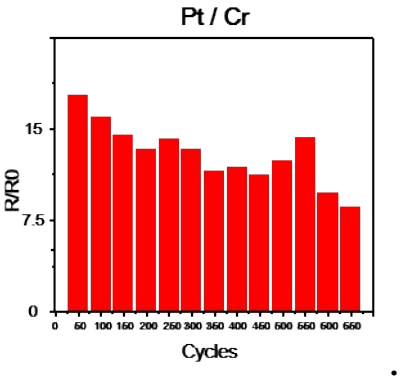

Figure S3. A marathon test of a Pt layered crack sensor without MoO_3 layer by repeating loading/unloading process about 650 cycles at strain from 0% to 2%.

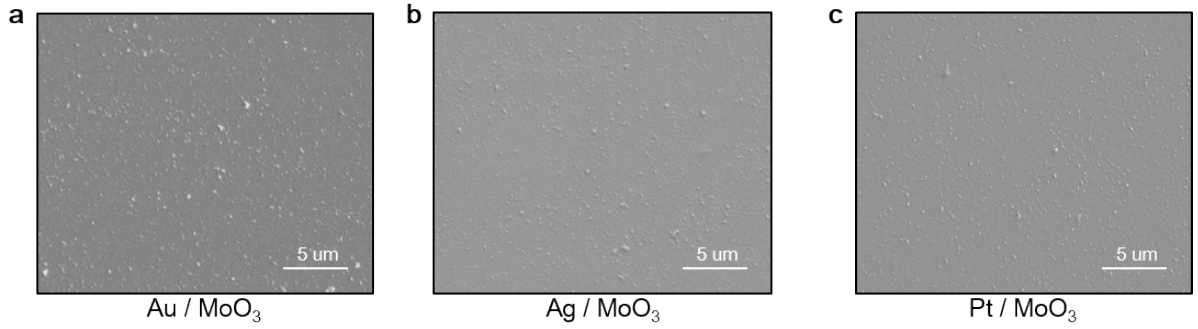

Figure S4. The SEM image of the conductive materials deposited on the MoO_3/PET substrates. (a) Au deposited MoO_3/PET substrates. (b) Ag deposited MoO_3/PET substrates. (c) Pt deposited MoO_3/PET substrates.

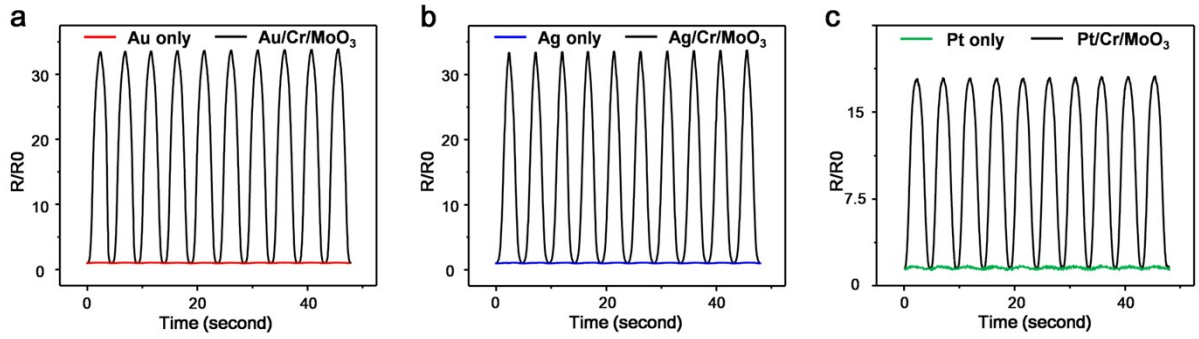

Figure S5. The graph of comparison between the conductive materials deposited on the PET substrates and the metal layered crack sensors with strain of 2% in a 10 time cyclic test. (a) The graph of comparison between the Au deposited on the PET substrates (red line) and the Au layered crack sensor (black line). (b) The graph of comparison between the Ag deposited on the PET substrates (blue line) and the Ag layered crack sensor (black line). (c) The graph of comparison between the Pt deposited on the PET substrates (blue line) and the Pt layered crack sensor (black line).

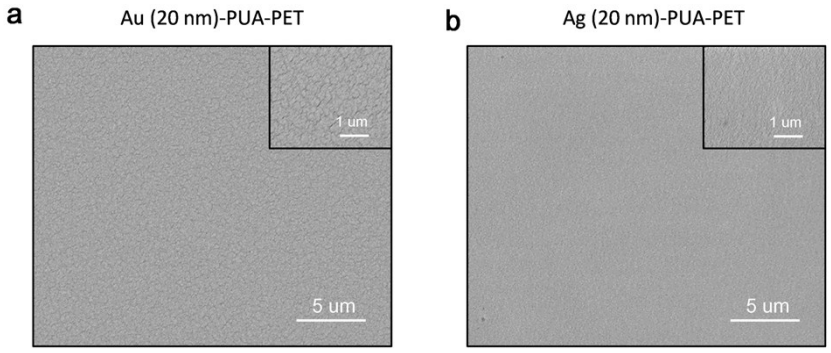

Figure S6. The SEM image of the conductive materials deposited on the PUA/PET substrates. (a) Au deposited PUA/PET substrates. (b) Ag deposited PUA/PET substrates.

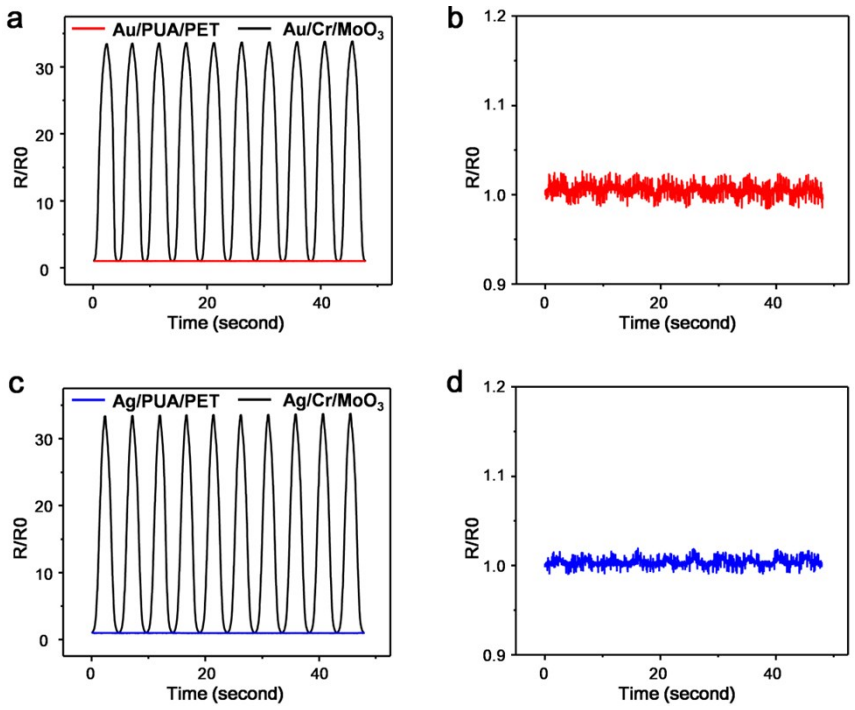

Figure S7. The graph of comparison between the conductive materials deposited on the PUA/PET substrates and the metal layered crack sensors with strain of 2% in a 10 time cyclic test. (a) The graph of comparison between the Au deposited on the PUA/PET substrates (red line) and the Au layered crack sensor (black line). (b) The Au deposited on the PUA/PET substrate graph of the normalized resistance variance versus strain of 2%. (c) The graph of comparison between the Ag deposited on the PUA/PET substrates (red line) and the Ag layered crack sensor (black line). (d) The Ag deposited on the PUA/PET substrate graph of the normalized resistance variance versus strain of 2%.