

Electronic Supplementary Information (ESI)

Flexible and highly sensitive pressure sensors based on microcrack arrays inspired by scorpion

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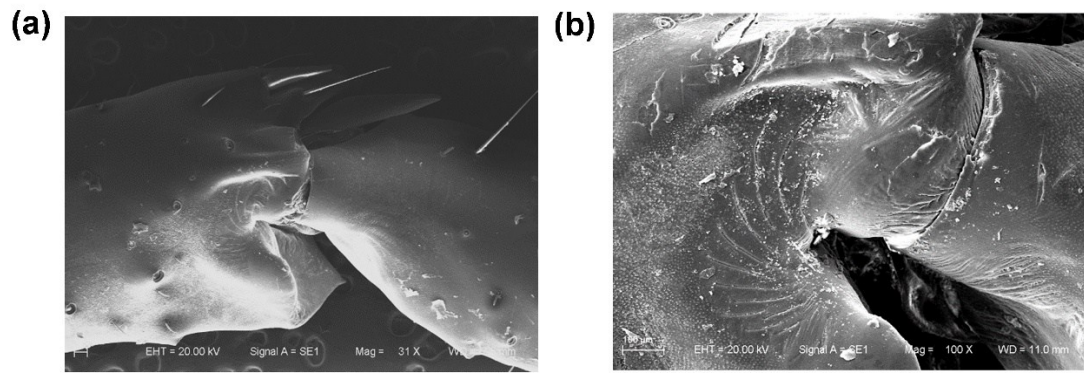


Figure S1 Slit sensillum of scorpion. (a) SEM image shows the slit sensillum positioned in the distal end of the metatarsus. (b) SEM image of the overall slit sensillum.

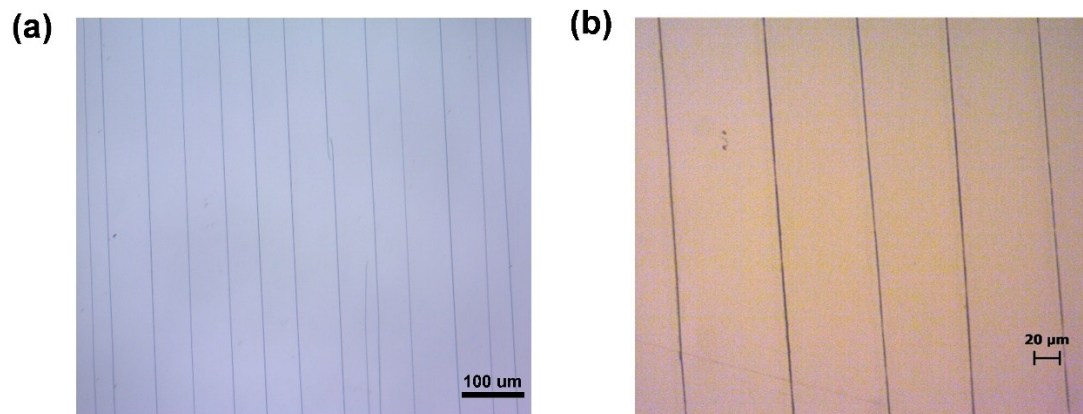


Figure S2 The crack arrays presented on the top of the petri dish lid. (a), (b) Metallographic microscopic images of the petri dish lid after solvent-induced.

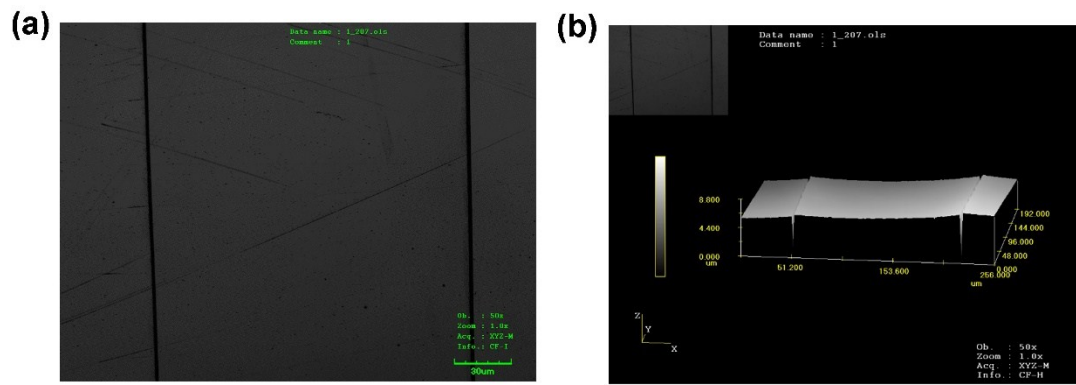


Figure S3 The crack arrays presented on the top of PDMS. (a), (b) Confocal microscopy images show the approximately parallel microcracks in a small visual field.

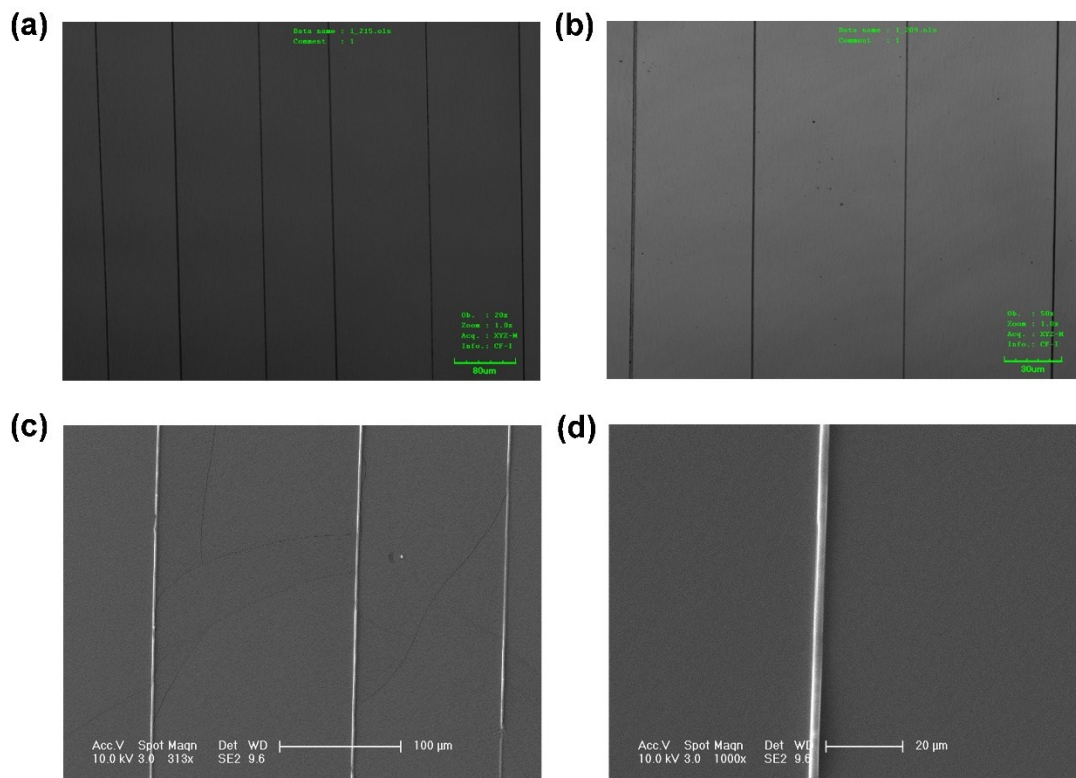


Figure S4 The reversed pattern of crack arrays presented on the top of PDMS. (a), (b) Confocal microscopy images show the arrangement of the reversed pattern of crack arrays. (c), (d) SEM images showing more details about the reversed pattern of crack arrays.

Table S1 The comparison of the sensitivities for previous reported pressure sensors.

| Microstructure surface | Sensitivity (kPa ⁻¹) ^a | Working principle | Response time (ms) | Ref. |
|-----------------------------|---|-------------------|--------------------|------|
| Random Distributed Spinosum | 30.1–25.1 | piezoresistive | millisecond range | 1 |
| Hemisphere | 5.53–15.14 | piezoresistive | 40 | 2 |
| Pyramid 1 | 0.76 | capacitance | | 3 |
| Pyramid 2 | 5.53 | piezoresistive | 0.2 | 4 |
| Pyramid 3 | 0.31 | piezoelectric | 5 | 5 |
| Cylinder | 2.0 | piezoresistive | 50 | 6 |
| Pyramid & Cylinder | 0.54–0.58 | capacitance | 30 | 7 |
| Wave | 3.8 | capacitance | 150 | 8 |
| Pillar | 1.8 | piezoresistive | 100 | 9 |
| Nanowire 1 | 5.54 | capacitance | unstated | 10 |
| Nanowire 2 | 0.33 | piezoresistive | 1 | 11 |
| Pillar & nanowire | 6.82 | piezoresistive | 5 | 12 |
| Prism | 1.8 | piezoresistive | 10 | 13 |
| Microgrooves | 7.7–41.9 | piezoresistive | 50 | 14 |

a) Note that all the sensitivities have defined as an absolute value.

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