

Supplementary Material

High-performance Flexible Piezoresistive Pressure Sensor Based on Multi-layer Interlocking Microstructures

Meng Wang^{1*}, *Gongdong Wang*^{1,2*}, *Mingyang Zheng*¹, *Lei Liu*¹, *Chengyang Xu*¹,
*Zhendong Liu*¹, *Long He*²

¹ School of Aerospace Engineering, Shenyang Aerospace University, Shenyang 110136, China

² Zhiyuan Research Institute, Hangzhou 310012, China

*Correspondence to: wm18842473310@163.com

*Correspondence to: cadcam119@126.com

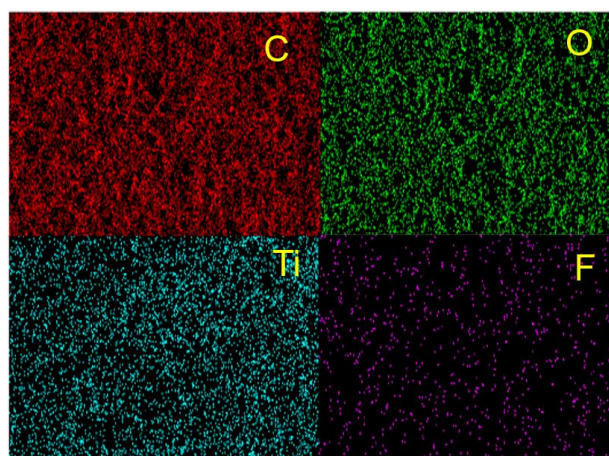


Fig. S1. The EDS elemental mapping of the TPU/MXene fiber membrane.

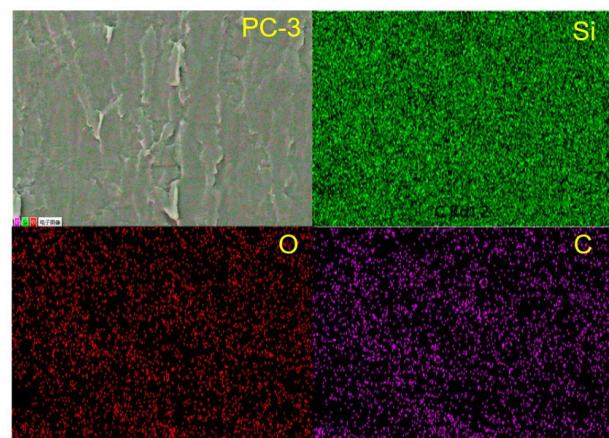


Fig. S2. The EDS elemental mapping images of C, Si, and O obtained from PC-3.

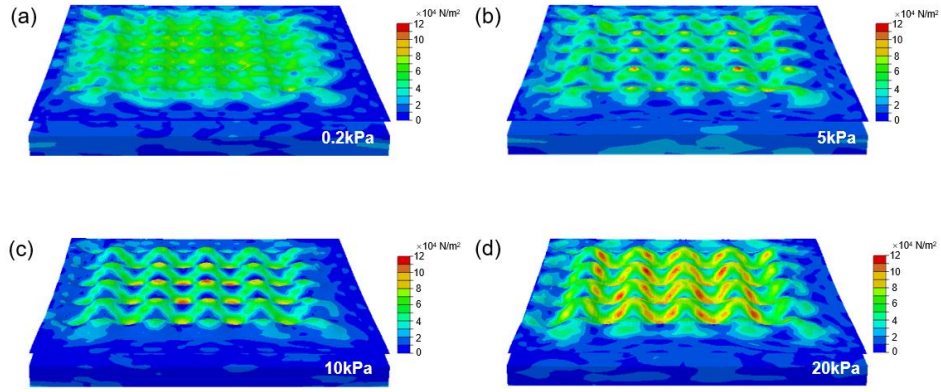


Fig. S3. The stress-strain distribution of the TPU/MXene fibre film at different pressures: (a) 0.2 kPa, (b) 5 kPa, (c) 10 kPa, (d) 20 kPa.

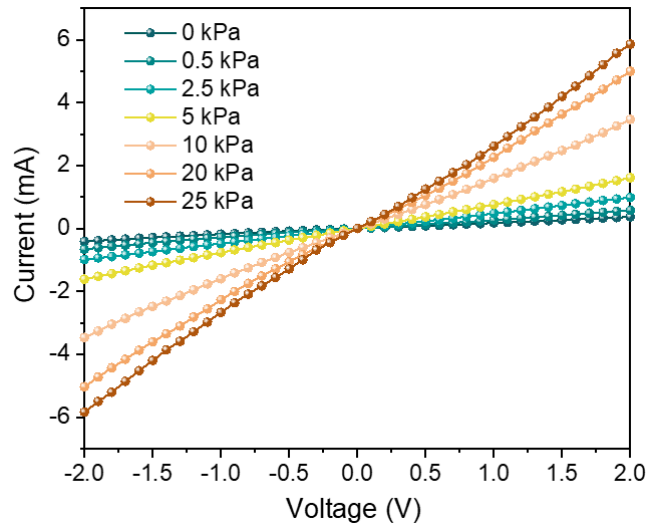


Fig. S4. The I-V characteristic curves of the PC3-TM1 pressure sensor at different pressures.

Table S5 A summary of the properties of recently published pressure sensors.

Ref.	Materials	Structure	Sensing range (kPa)	Highest S (kPa^{-1})
This work	PDMS/CNT-TPU/MXene	microdome array and electrospun fibrous	25	82.17(<0.2 kPa)
1[57]	TPU/c-MWCNTs	electrospun fibrous network	10	2(<0.2 kPa)
2[58]	PAN carbonisation	3D nanofiber networks	2.5	1.41(<0.25 kPa)
3[59]	CNF/PDMS	electrospun fibrous	2	0.96(<0.5 kPa)
4[36]	MXene/PEDOT:PSS	porous aerogel	11	26.65(<2 kPa)
5[12]	GO/MXene/silk fibroin	3D foam	1.4	14.23

6[60]	CNT/PDMS	hybrid porous microstructures	10	83.9(<0.14 kPa)
7[50]	PU/AgNW	microdome array	10	6.258(<0.04 kPa)
8[61]	MXene@PDMS	micro protrusion structure from the sandpaper	30	2.6
9[62]	CNT/CB/PDMS	bioinspired spinosum microstructure film	7.5	32.9(<0.05 kPa)