

Supporting Information

Liquid metal-embedded 3D interconnected-porous TPUMXene composite with improved capacitive sensitivity and pressure detection range

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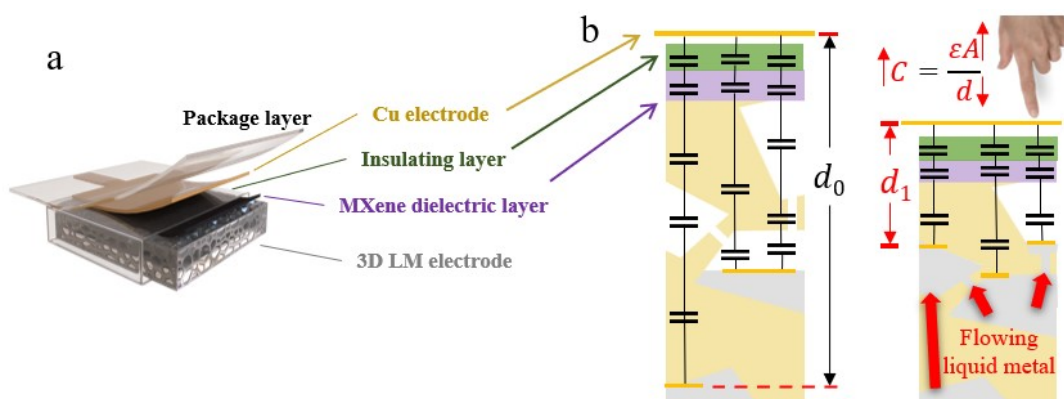


Fig S1. Schematic of construction of the as-proposed TMLS. (a) Exploded schematic illustration of a TMLS. Schematic illustration of (b) mechanical deformation behavior of TMLS during pressure loading.

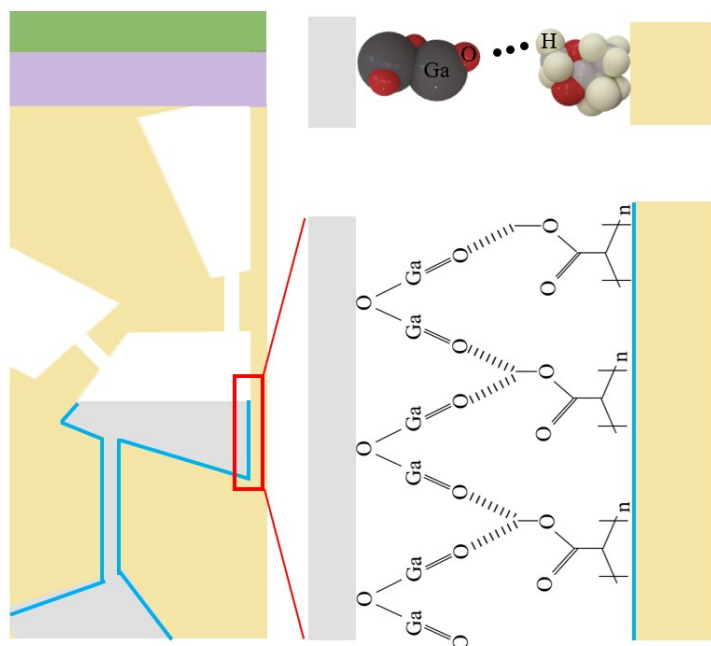


Fig S2. The schematic diagrams of the chemical interaction between PMA and EGaIn.

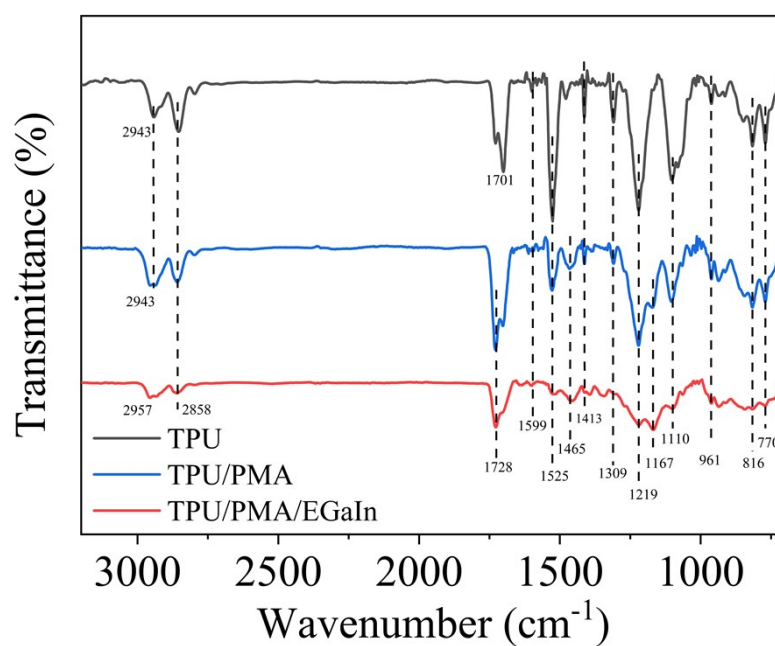


Fig S3. FT-IR spectra of TPU, TPU/PMA composite foam, and TPU/PMA/EGaIn composite foam.

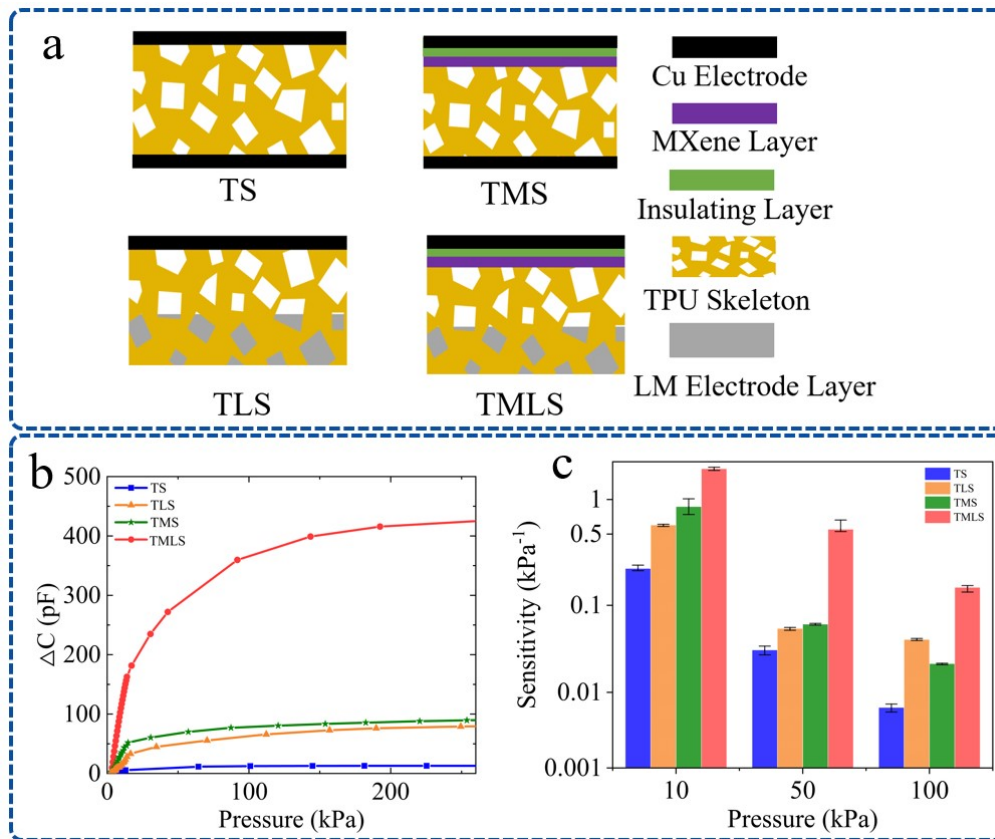


Fig S4. Comparison of TMLS and other capacitive pressure sensor counterparts. (a) Schematic illustration of the three conventional capacitive pressure sensors and TMLS (b) Pressure-capacitance variation curve of the four sensors. (c) Sensitivity comparison of the four sensors.

Table S1 A comparison of the sensing performance of reported sensors¹⁻¹⁹.

Ref.	Maximum Sensitivity (kPa^{-1})	Maximum detectable pressure (kPa)	Minimum Detection limit	Response/relaxation time (ms)	Durability (cycles)
This work	1.91	260	10 Pa	60/110	4000
[1]	0.49	11	20 Pa	30/30	300
[2]	1.21	28	0.9 Pa	100/100	10000
[3]	0.283	33	-	-	20000
[4]	0.141	100	0.16 g	190/210	1000
[5]	0.065	1700	-	100/100	7000
[6]	0.201	4500	-	60/30	1000
[7]	6.583	1	3 Pa	48/36	10000
[8]	0.37	115	-	84/105	7600
[9]	4.4	115	0.8 Pa	16/46	50000
[10]	0.854	2.1	1 Pa	-	-

[11]	2.1	70	1.3 Pa	50/50	3600
[12]	0.41	55	0.005g	33/33	1000
[13]	0.18	400	10 Pa	100/100	10000
[14]	0.159	145	-	49/51	9000
[15]	4.2	32	1.6 Pa	26/26	10000
[16]	4.05	100	0.6 Pa	26/52	14000
[17]	0.023	200	-	155/-	1000
[18]	0.124	150	-	167/117	1000
[19]	0.055	10	-	200/150	-

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