

Facile fabrication of stretchable, anti-freezing, and stable organohydrogels for strain sensing at subzero temperatures

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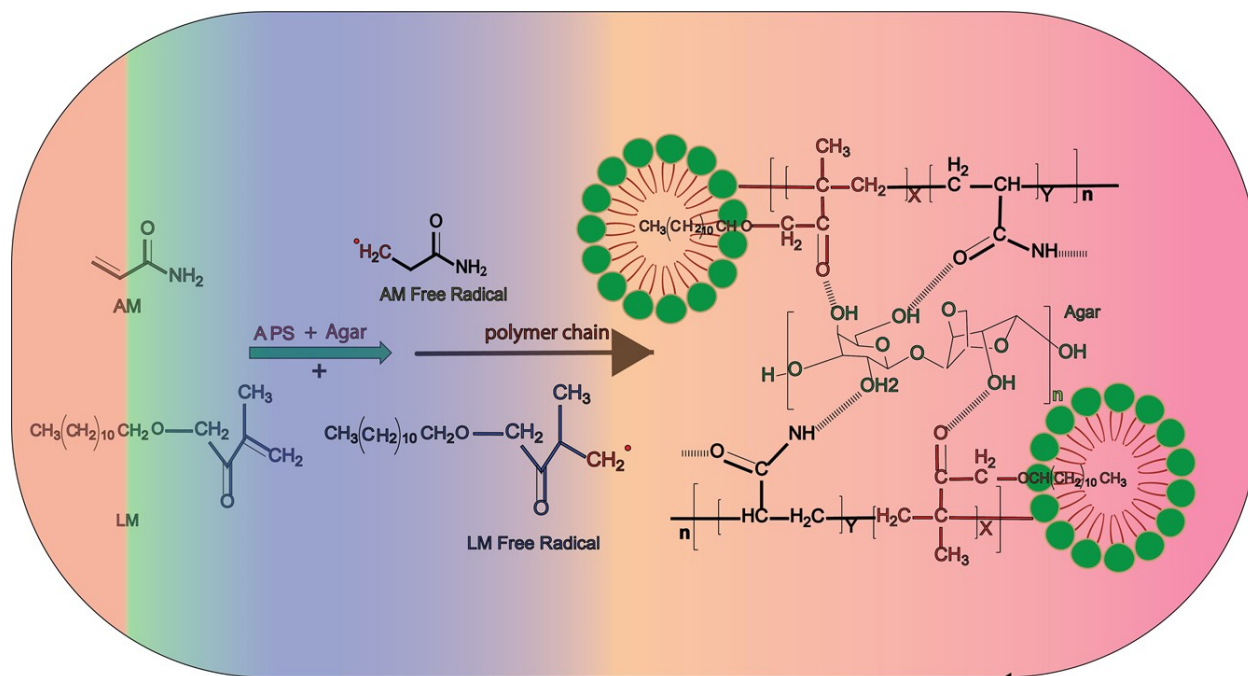


Figure S1, schematic steps of polymerization and targeted polymer internal chemistry

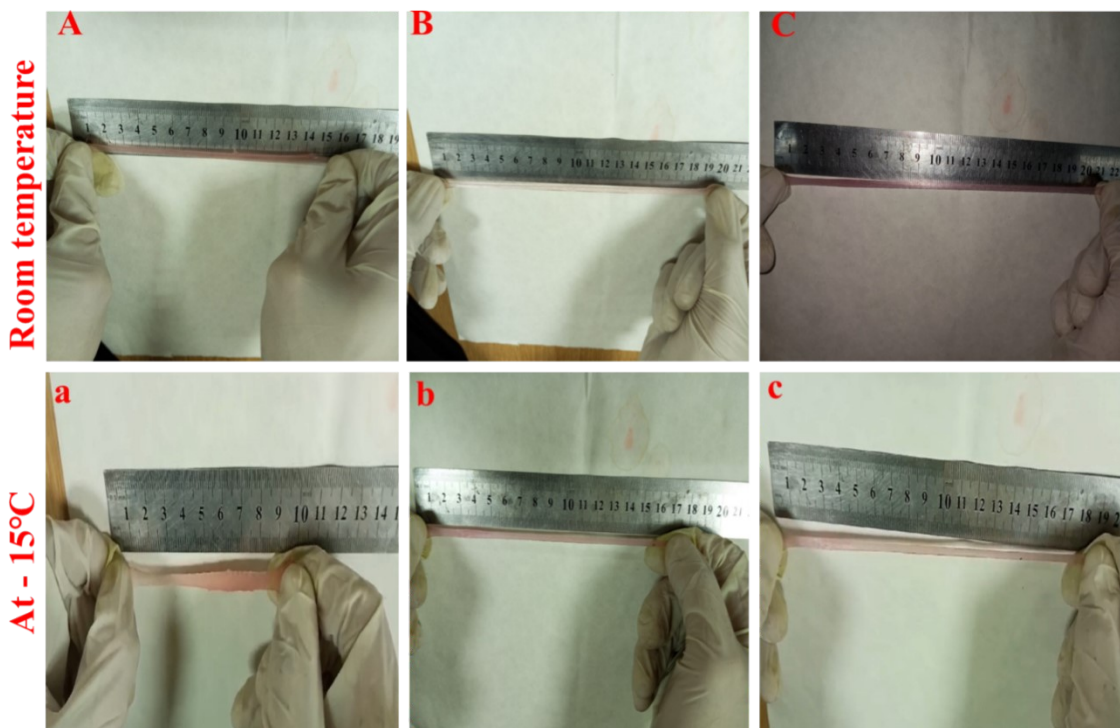


Figure S2 Photographs showing the stretching of hydrogels and OHGs at room temperature and at -15°C . At room temperature picture A, B, and C respectively shows the stretching of sample S6, S1, and S2. Similarly, picture a, b, and c shows the stretching of samples S6, S1, and S2 at -15°C respectively.

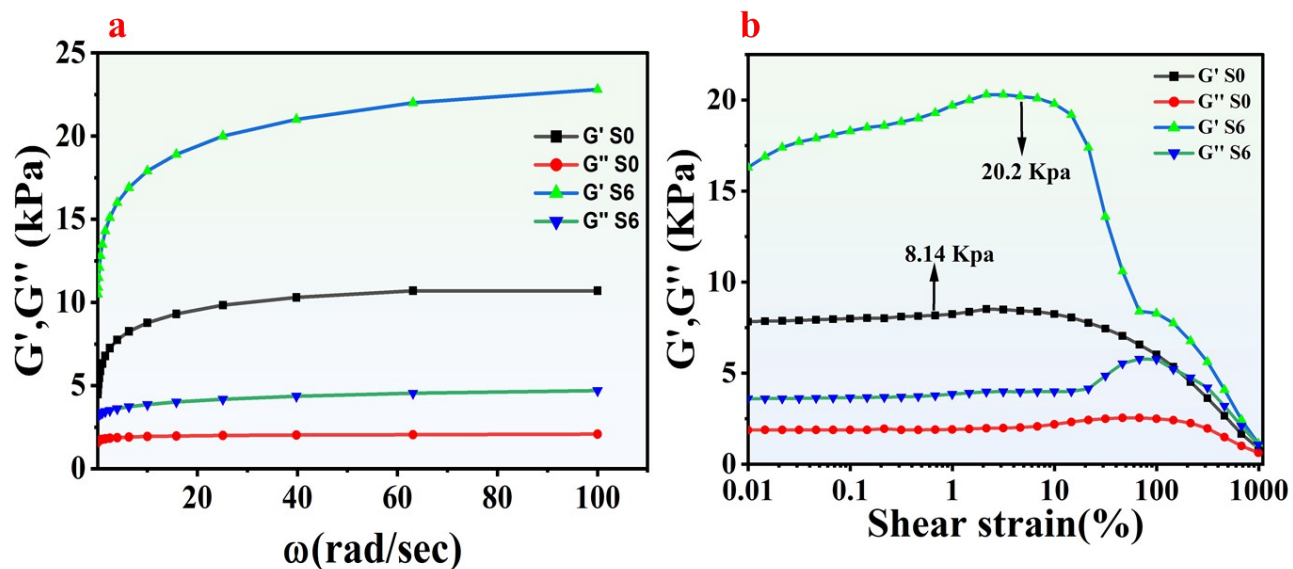


Figure S3 The rheological investigation of samples S0 and S6. (a) the frequency sweep test between 0.1 to 100 rad/sec, (b) the amplitude sweep study performed between 0.01 to 1000% strains at a constant frequency of 10 rad/sec.

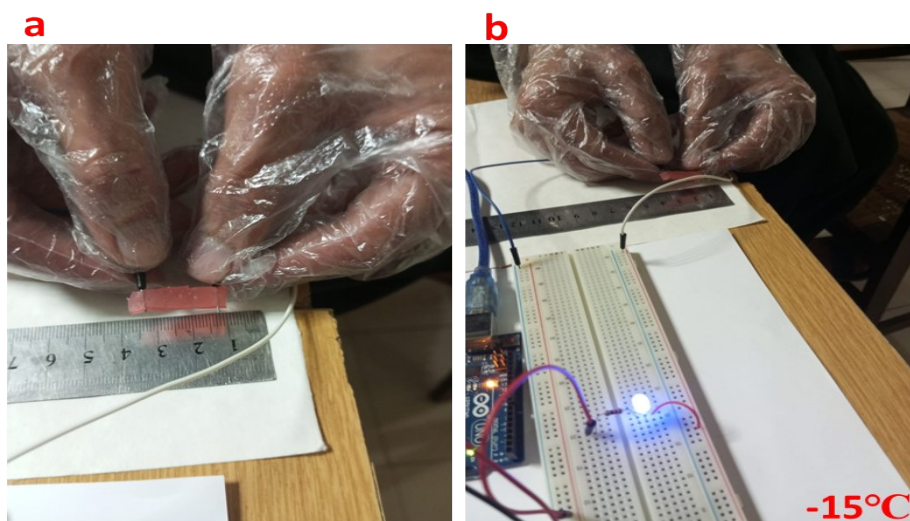


Figure S4 Demonstration of strain sensitivity in view of LED performance towards OHGs, (a) a small piece of sample S2 attached to the two electrodes, (b) LED illumination showing the conductive nature of the OHGs.

Table S1 Comparison of the key performance parameters of the current research with those recently reported studies of the same type.

Hydrogel composition	Gauge factor	Working temp. range (°C)	Stretchability (%)	Response/recovery time (ms)	Conductivity (S/m)	References
HPMC-g-P(AN-co-AM)	-	-25 to 25	1730	-	1.54	[1]
(PACG-M) Ti3C2TX MXene	3.93	- 20 to 80	1000	500	1.34	[2]
PDMS-MXene/CNF	-	-20 to 200	-	-	10^{-8} to 10	[3]
MWCNT/CB-PDMS	8	RT	35	1200/2400	-	[4]
PAmm/PDDMA/MA	6.9	RT	2102	80/60	0.20	[5]
PAM-QACNF-MXene	2.24	RT	1465	141/140	1.281	[6]
Poly(Am-co-LM@Ag)	10.14	-15 to 25	1200	100/80	0.45	This work

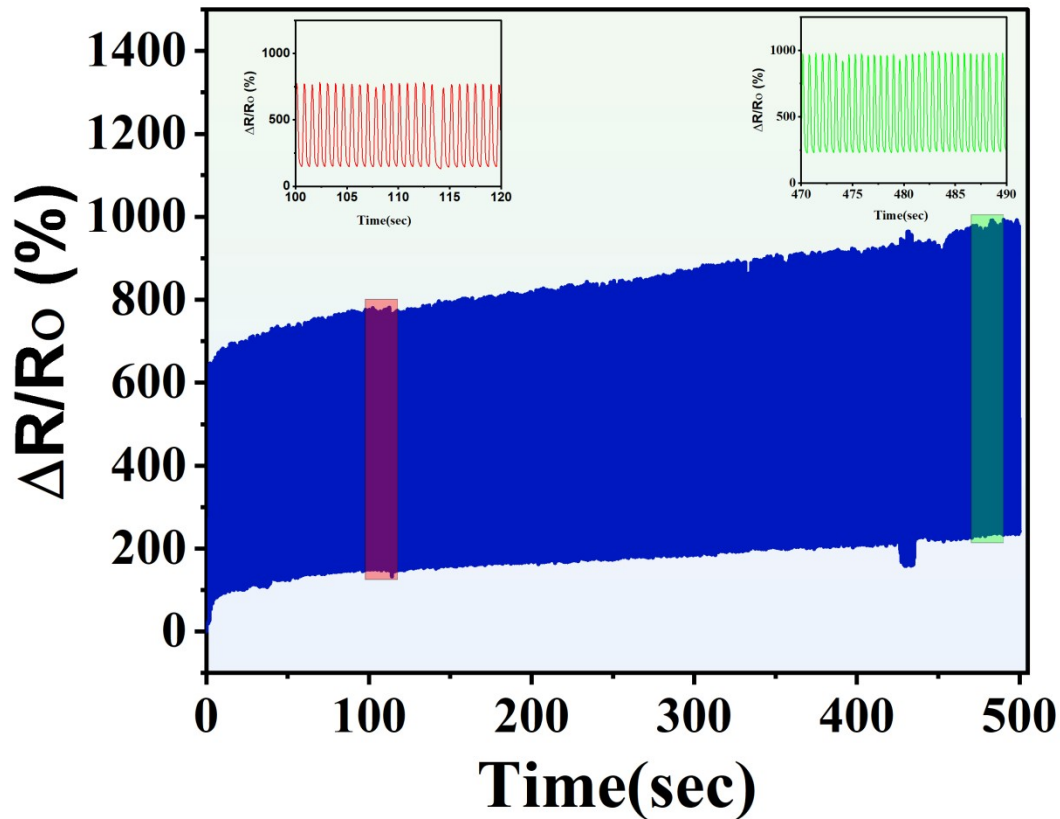


Figure S5 Multiple cycles test showing fatigue resistance over a strain of 200%.

References

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