Supporting information

Polysaccharide-tackified composite hydrogel for skin-attached sensors

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Table S1 Recipes for GA/rGO/PAAm hydrogels.

Samples	GA (g)	rGO (g)	AAm (g)	MBA (g)	KPS (g)	TMEDA (μL)	H_2O (mL)
1	0	0	4	0.002	0.04	35	20
2	0	0.3	4	0.002	0.04	35	20
3	0.5	0.3	4	0.002	0.04	35	20
4	1	0.3	4	0.002	0.04	35	20
5	1.5	0.3	4	0.002	0.04	35	20

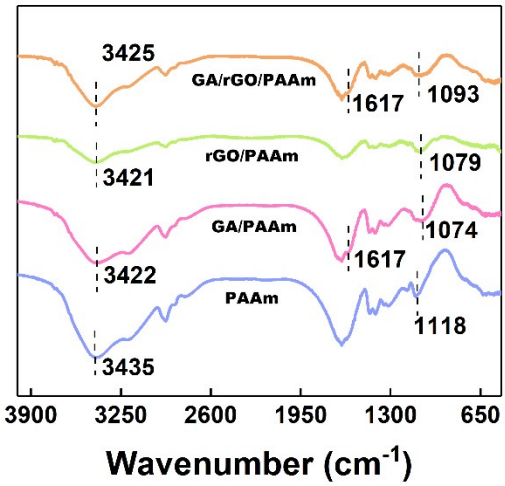

Figure S1 FTIR curves of PAAm hydrogel, GA/PAAm hydrogel, rGO/PAAm hydrogel, and GA/rGO/PAAm hydrogel.

To characterize the physically interactions between GA, rGO, and PAAm, the FTIR curves results for PAAm hydrogel, GA/PAAm hydrogel, rGO/PAAm hydrogel, and GA/rGO/PAAm hydrogel were exhibited in Figure S1. After introducing GA and rGO, it can be found that the overlapping peak due to amino and hydroxyl groups (N–H and O–H stretching vibration absorption peak) for PAAm hydrogels at 3435 cm-1 shifted to 3422 cm-1, 3421 cm-1, and 3425 cm-1, respectively, indicating that –OH of GA and rGO may participate in the reaction. With the introduction of GA, the hydrogels had the stretching vibrational absorption peak of carboxyl groups at 1617 cm^{-1}. In addition, the stretching vibrational absorption peak of C-O-C at 1118 cm-1 moved to 1074 cm-1, 1079 cm-1, and 1093 cm-1, respectively, further illustrating the GA also participated in the reaction. It is well-known that the formation of intra- or intermolecular H-bonding reduces the force constants of the chemical bonds, therefore their vibrational frequency is shifted to the lower wavenumber.

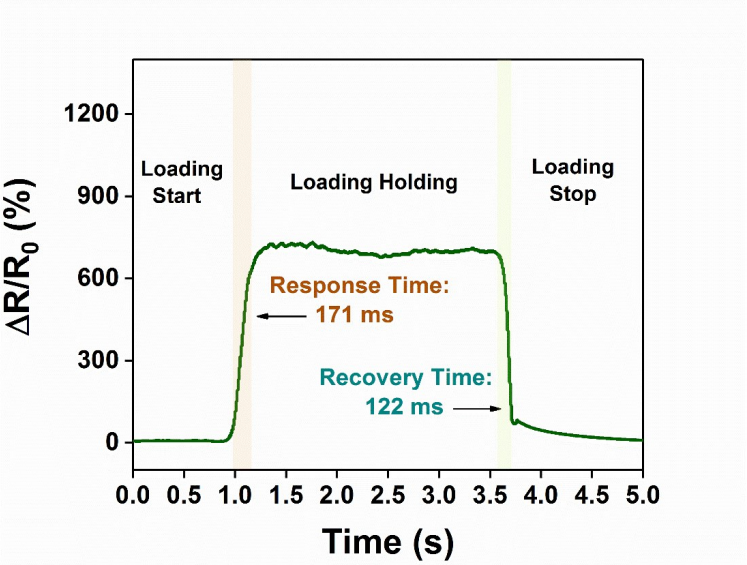

Figure S2 The response time and recovery time of hydrogel strain sensor.

As shown in Figure S2, it exhibited fast response and recovery time of 168 ms and 136 ms. The relevant content has been added in the Supporting Information of the revised manuscript.

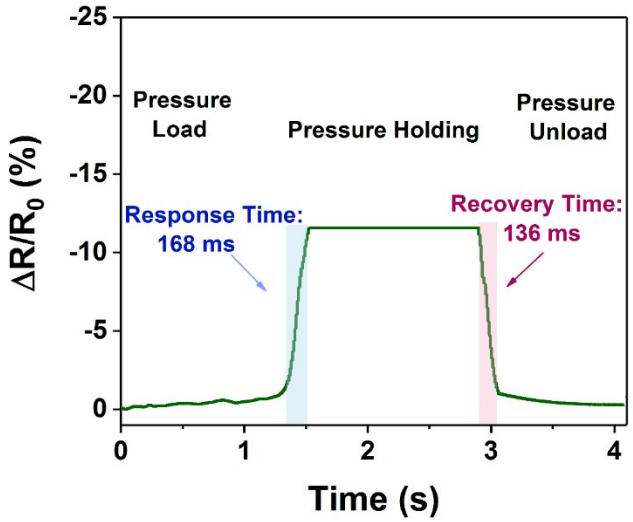

Figure S3 The response time and recovery time of hydrogel pressure sensor.

As shown in Figure S3, the hydrogel pressure sensor showed a rapid response time of 168 ms during pressure loading. At the same time, the pressure hydrogel sensor had a recovery time as short as 136 ms during pressure unloading.

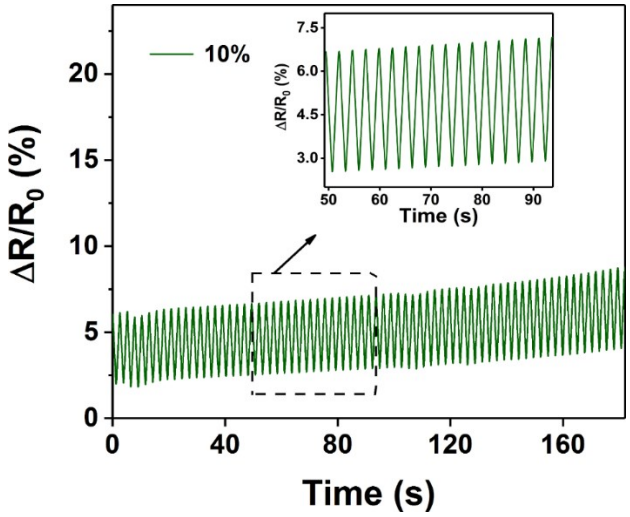

Figure S4 The 70 compressive cycles at maximum pressure of 10 kPa.

The continuous 70 loading-unloading cycles at pressure of 10 kPa were performed, which shown in Figure S4, the resistance change of sensor showed excellent stability and repeatability, which was attributed to the elasticity and rapid recoverability of dynamic cross-linked network of hydrogel.