Supporting Information

Self-healing Polyacrylamide (PAAm) Gels at Room Temperature Based on Complementary Guanine and Cytosine Base Pairs

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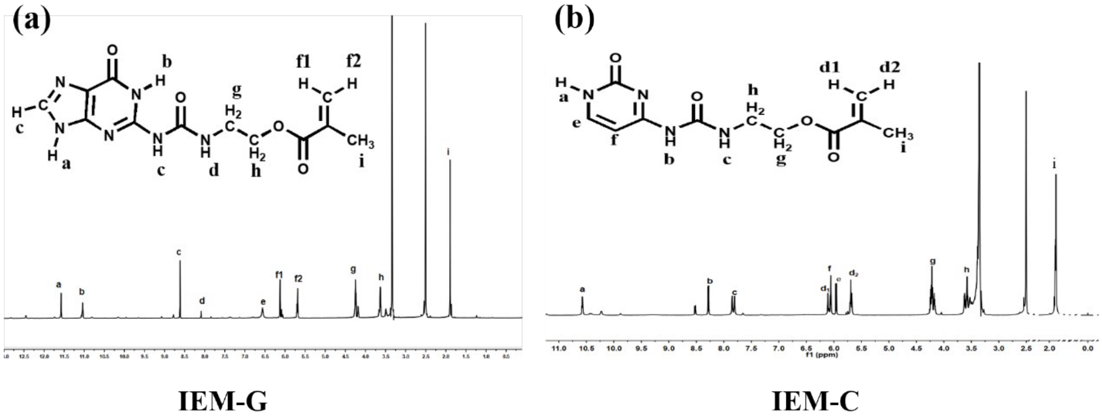

Fig. S1. The ^{1}H NMR spectrum of a) IEM-G and b) IEM-C in DMSO-d6.

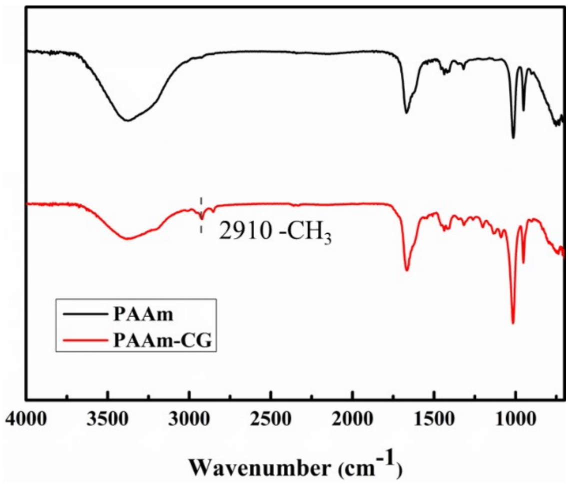

Fig. S2. Fourier transform infrared spectroscopy (FT-IR) spectra of PAAm and PAAm-CG gel.

Table S1. Different DMSO ratio in preparing PAM-based materials

AAm（g）	NAPP（wt%）	TMEDA（wt%）	APS（wt%）	$\frac{m(IEM-C/G)}{m(AAm)}$	DMSO (mL)
1.5	1	1	1	1/30	1.5
1.5	1	1	1	1/30	2.0
1.5	1	1	1	1/30	2.5
1.5	1	1	1	1/30	3.0

1.5 mL DMSO is not enough to dissolve all solid components, so the stress and strain of the gel cannot be accurately measured. It can be seen from Fig. S2 that when the amount of solvent DMSO is 2 mL, the gel obtained has better mechanical properties.

Table S2. Mechanical properties with different IEM-CG addition ratio in preparing PAM-based materials

$\frac{m(IEM-C/G)}{m(AAm)}$	1:10	1:20	1:30	1:40	0
elastic modulus (KPa)	31.73±2.1	35.39±1.7	28.42±2.4	18.31±3.2	10.08±2.7
failure tensile stress (KPa)	59.84±2.6	93.91±1.4	97.61±2.9	58.16±3.5	38.86±3.3
failure tensile strain (%)	189	271	365	317	375
fracture energy (KJ/m^3)	56.64±1.8	130.04±2.3	176.58±2.9	92.38±3.6	74.88±2.7

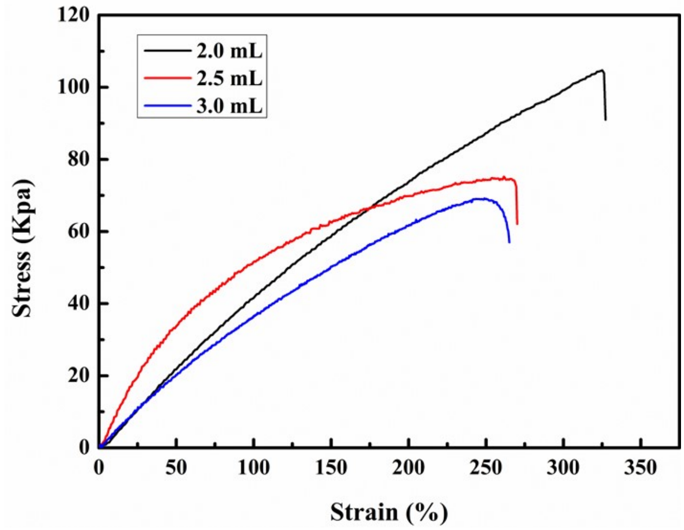

Fig. S3. Stress-strain curves of materials prepared with different volumes of DMSO.

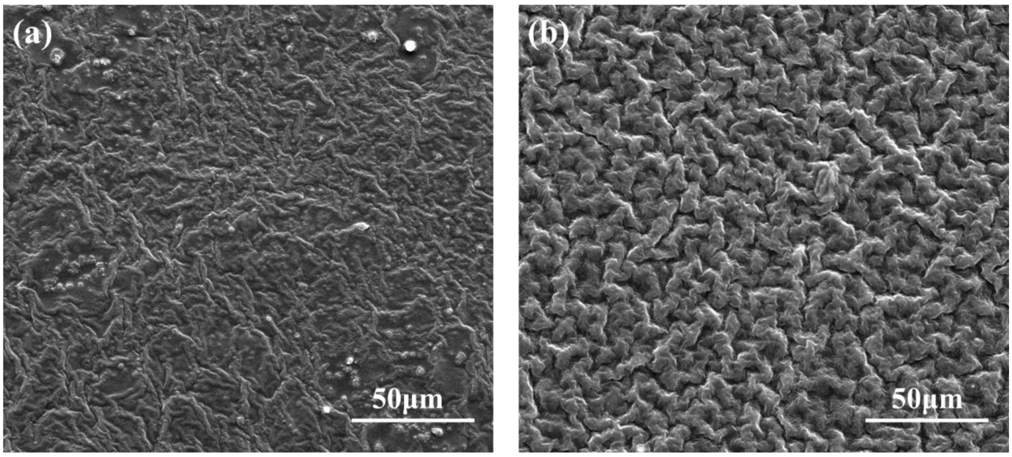

Fig. S4. SEM image of pure PAAm (a) and PAAm-CG (b) gel.

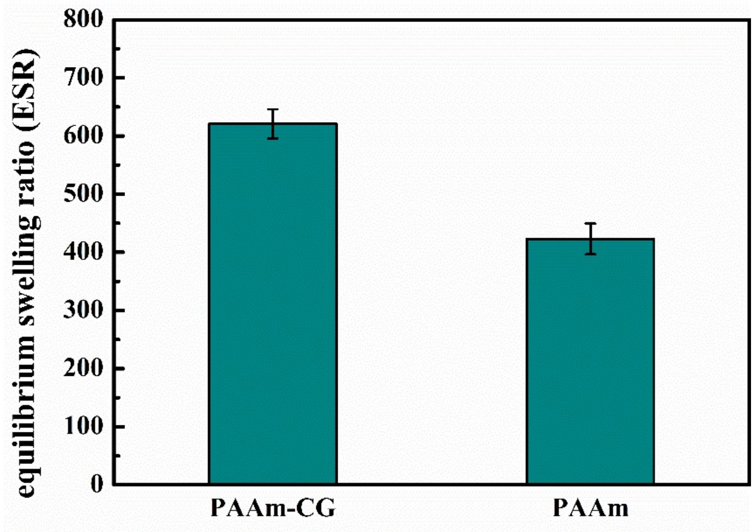

Fig. S5. The equilibrium swelling ratio of PAAm-CG and PAAm gel.

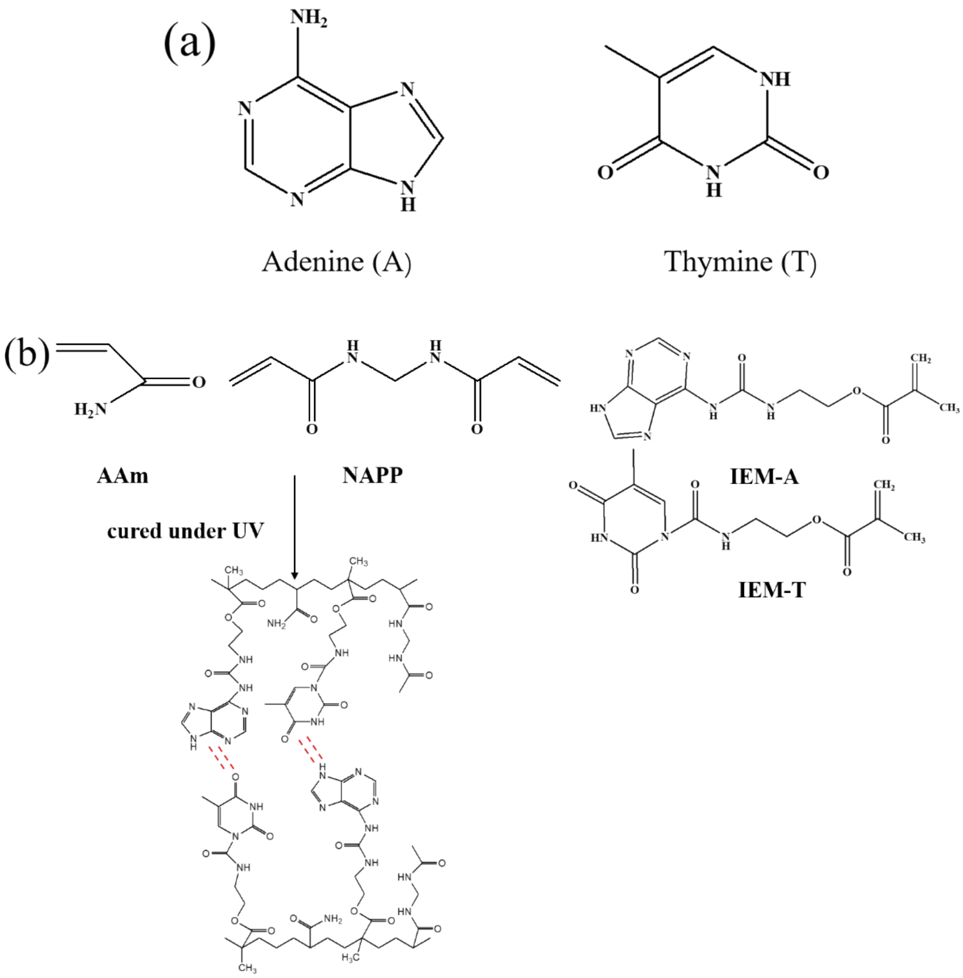

Fig. S6. Chemical structure of the adenine (A) and thymine (T) (a) and structure of PAAm-AT gel (b).

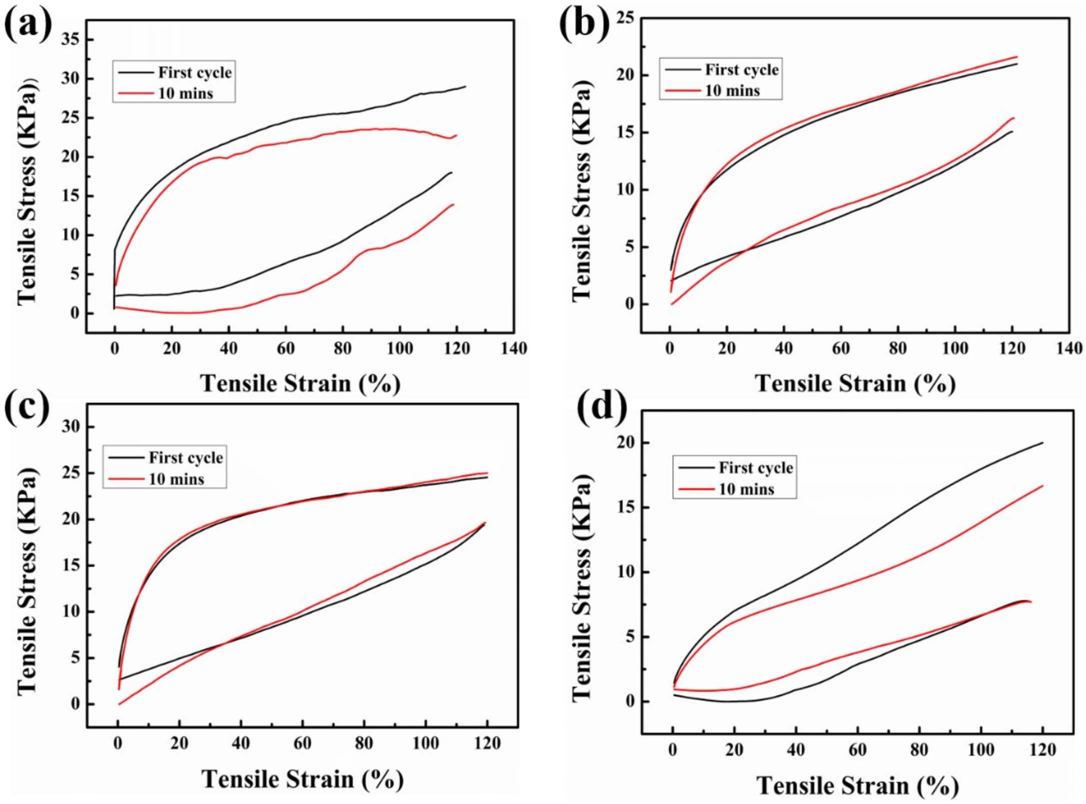

Fig. S7. Loading-unloading curves of self-healing PAAm-CG gels with different healing times at room temperature (a) 5 h, (b) 20 h, (c) 25 h. Loading-unloading curves of self-healing PAAm-CG gels at 50°C self-healing 6 h (d).

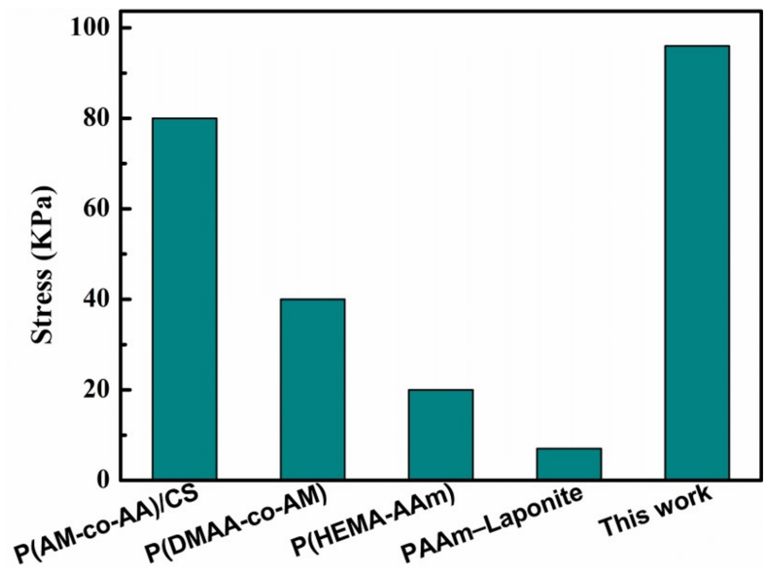

Fig. S8. Comparison of strain in different work.

Table S3. Comparison of self-healing efficiency of self-healing PAAm prepared in different work.

Works	Self-healing efficiency
P(AM-co-AA)/CS	67%
P(DMAA-co-AM)	80%
P(HEMA-AAm)	65%
PAAm–Laponite	85%
This work	90%