

Supporting Information

Revisiting the mechanism of redox-polymerization to build the hydrogel with excellent properties using a novel initiator

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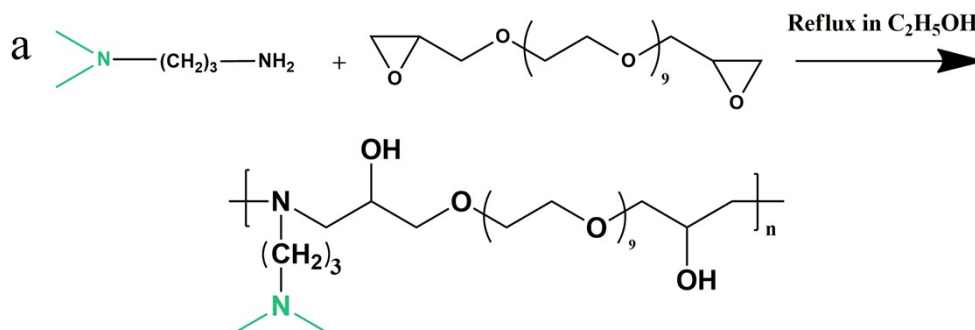


Figure S1. The process for synthesis of PEA. The weight averaged molecular weight M_w and the polydispersity index M_w/M_n were measured by GPC in the mobile phase of tetrahydrofuran (THF). The results showed that M_w was about 1.2×10^4 g/mol and M_w/M_n was about 1.5. Yield of PEA was nearly 98%.

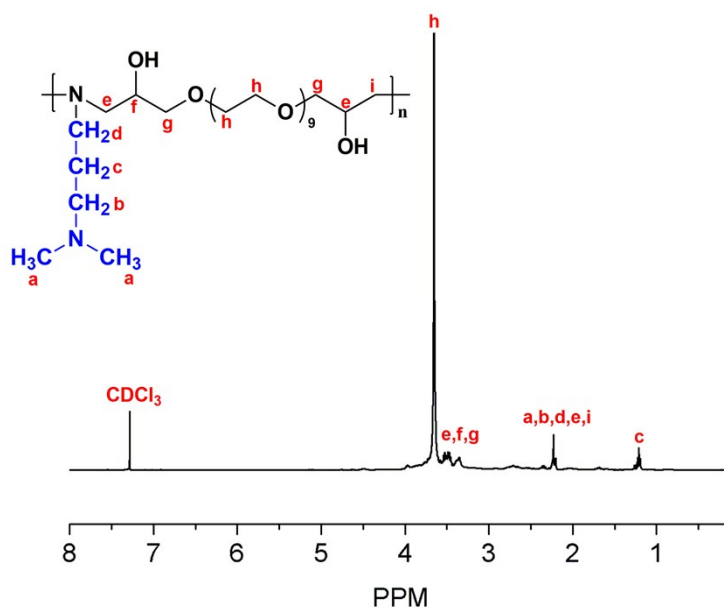


Figure S2. 1H NMR spectrum of synthesized PEA in $CDCl_3$. The peaks (a-i) in 1H NMR spectrum of PEA can be assigned to the related proton. Because of the high reactivity between primary amino groups and epoxy groups, almost all epoxy groups were ring-opened by DMPA according to the integral of 1H NMR spectra.

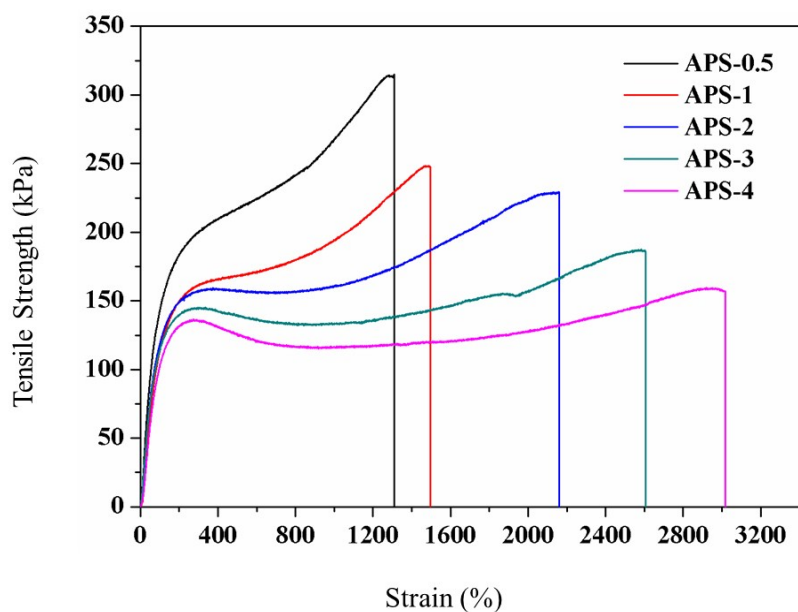


Figure S3. Effect of APS content for the mechanical properties of PEA-PAM hydrogels. The PEA content was fixed at 0.3wt% relatively to AAm monomer (5g). The water content was 70%. And the ratio of APS/PEA was changed from 0.5-4. The letter n of APS-n represents the related ratio of APS/PEA.

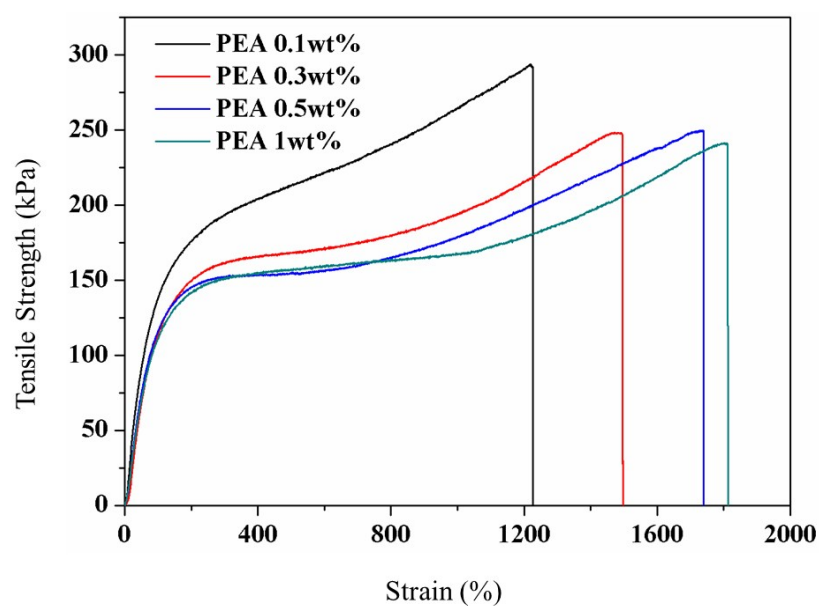


Figure S4. Effect of PEA content for the mechanical properties of PEA-PAM hydrogels. The amount of APS was fixed at 0.0057g. The PEA content was changed from 0.1wt%-1wt% relatively to AAm monomer (5g). The water content was 70%. The letter m of PEA-mwt% represents the weight ratio of PEA.

Table S1. Tensile modulus and elongation at break of the as-prepared APX-n and PEA-m sample.

	APS-n ^a					PEA-m ^b			
	APS-0.5	APS-1	APS-2	APS-3	APS-4	PEA-0.1	PEA-0.3	PEA-0.5	PEA-1
Modulus (MPa)	0.827	0.730	0.717	0.677	0.634	0.793	0.730	0.652	0.651
Elongation (%)	1296%	1510%	2186%	2617%	3020%	1218%	1510%	1746%	1759%

^aThe letter n of APS-n represents the related ratio of APS/PEA.

^bThe letter m of PEA-mwt% represents the weight ratio of PEA.

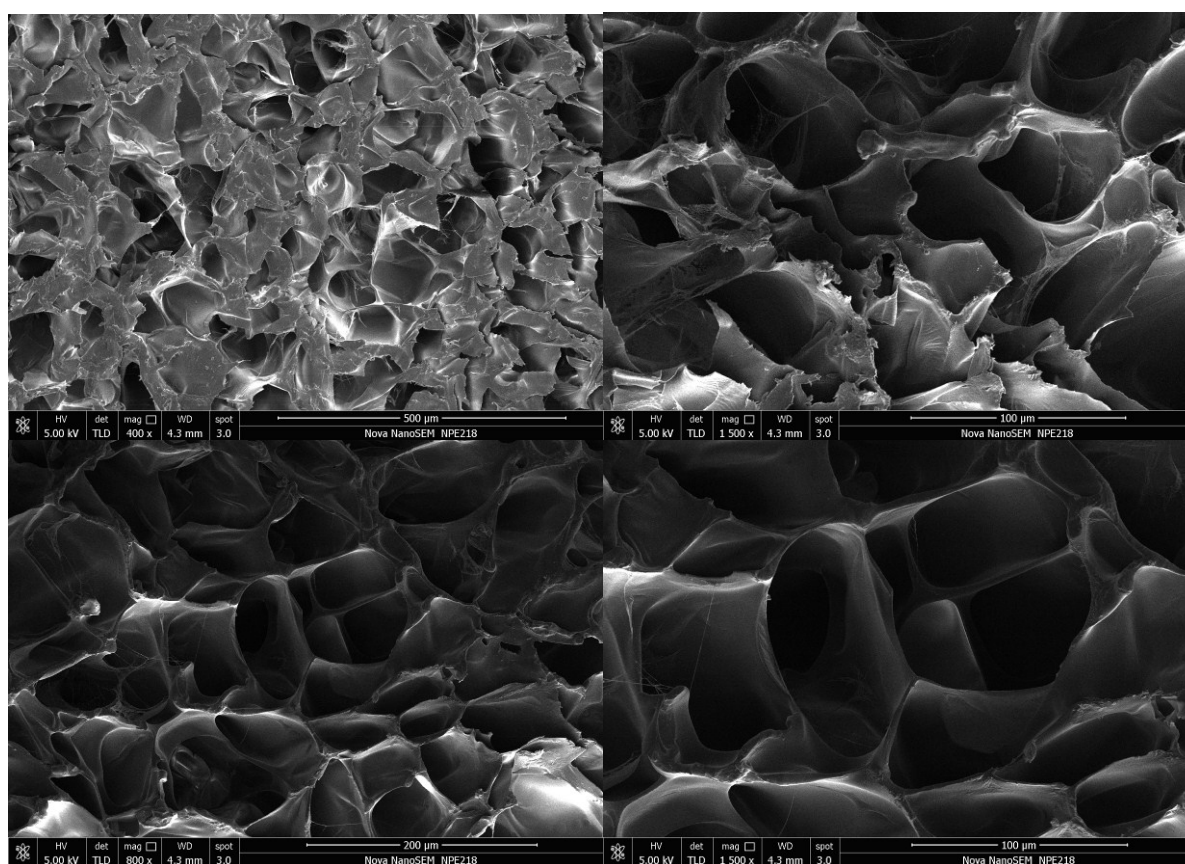


Figure S5. Representative SEM images of PEA-0.3wt%.