

Supplementary Information

“Rapid Self-Healing and Triple Stimuli Responsiveness of a Supramolecular Polymer Gel Based on Boron-Catechol Interactions in a Novel Water-Soluble Mussel-Inspired Copolymer”

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Table 1 shows the comparison between ^{13}C -NMR-peaks predicted depending on the neighboring monomers. The peaks given refer only to the centered monomer, marked bold. Peaks exhibiting a significant difference when in proximity to DMA vs. NIPMA are in bold numbers.

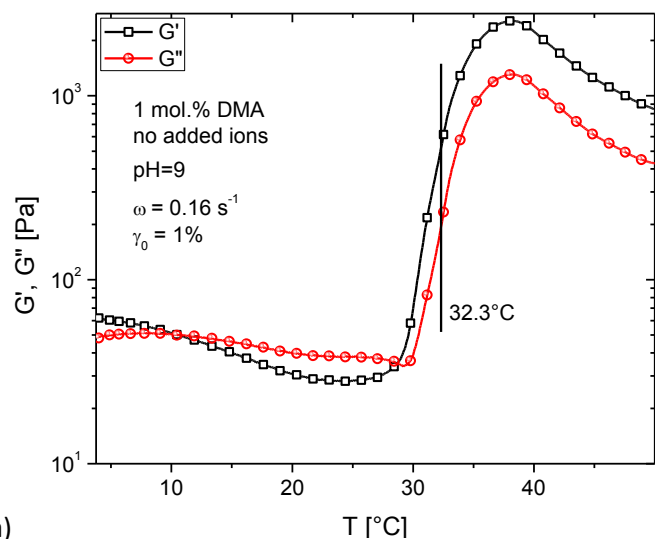
Table SI1. predicted ^{13}C -NMR-peaks

Name	NNN	NND	Name	NDN	NDD
α	38.5	36.5	a	35.8	30.8
β	173.4	173.4	b	22.8	23.4
δ	41.4	41.4			
γ	173.4	172.1	c	48.8	58
ε	23.3	23.3	d	172.1	172.1
			e	41.3	41.3
			f	36	36
			g	133.5	133.5
			h	114.8	114.8
			i	147.2	147.2
			j	144.5	144.5
			k	117.2	117.2
			l	121.8	121.8

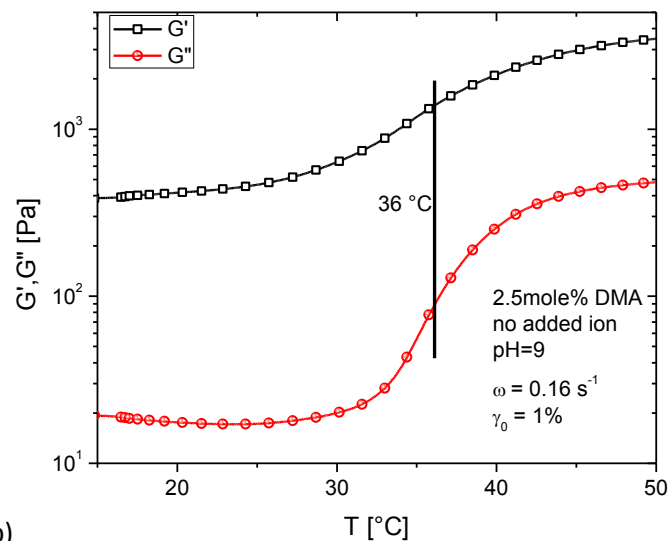
Table SI2. Time-dependent ¹H-NMR-peaks for checking for a random incorporation of both monomers

Time of polymerization (min)	Average area Of H from phenyl group of catechol [-]	Average area of H from Nipam monomer [-]	Dopa concentration in copolymer [mol%]
15	1.38	23.4	5.9
30	1.18	19.75	5.7
45	1.07	19.78	5.4
60	0.86	16.52	5.2
180	0.80	16.34	4.9

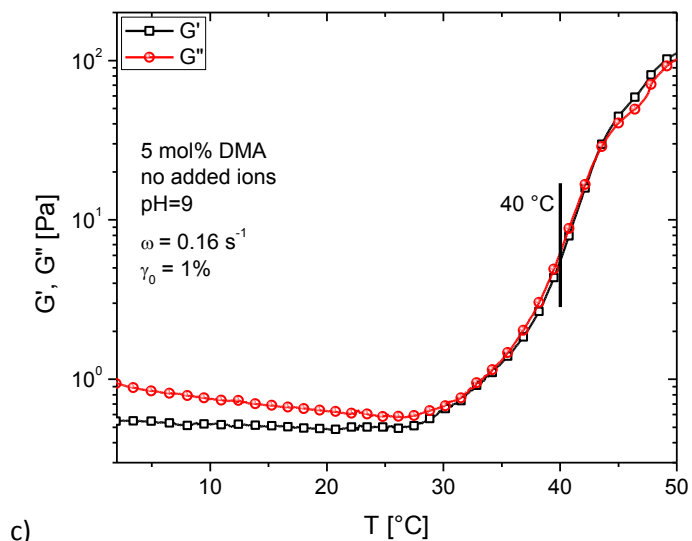
Rheological temperature ramps for the determination of the LCST-processes.



a)

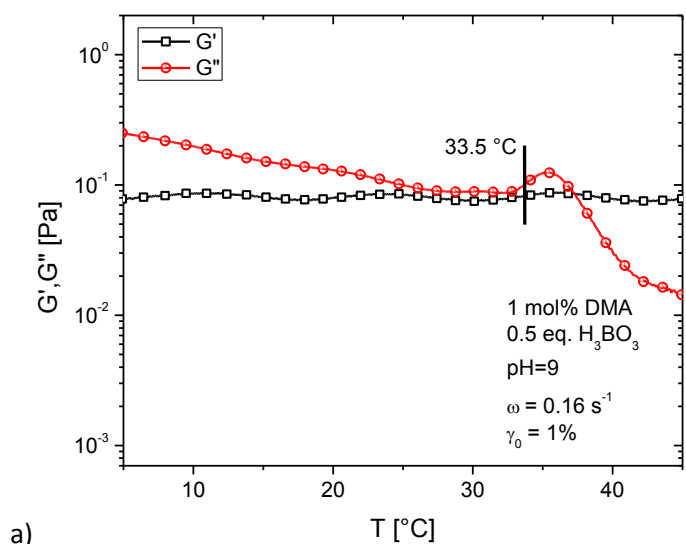


b)

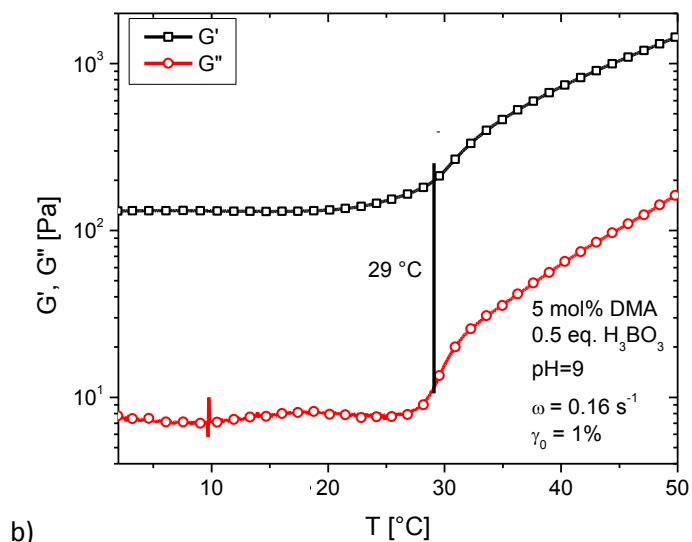


c)

Figure S11: Temperature dependence of copolymer at pH=9 without added ions a) NIDO1%, b) NIDO 2.5%, c) NIDO 5%.



a)



b)

Figure S12: Temperature dependence of copolymer at pH=9 with 0.5 eq. H_3BO_3 a) NIDO1%, b) NIDO 5%.

Please note that the data for NIDO2.5% at pH=9 with 0.5 eq. H_3BO_3 is included in Figure 8a in the main article.

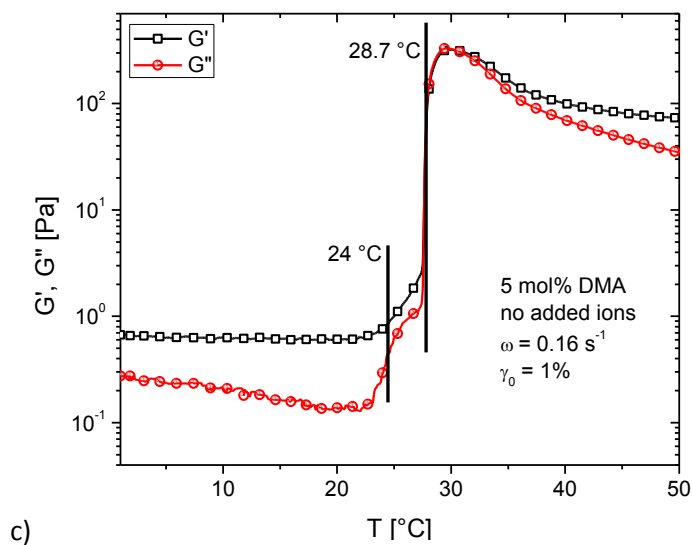
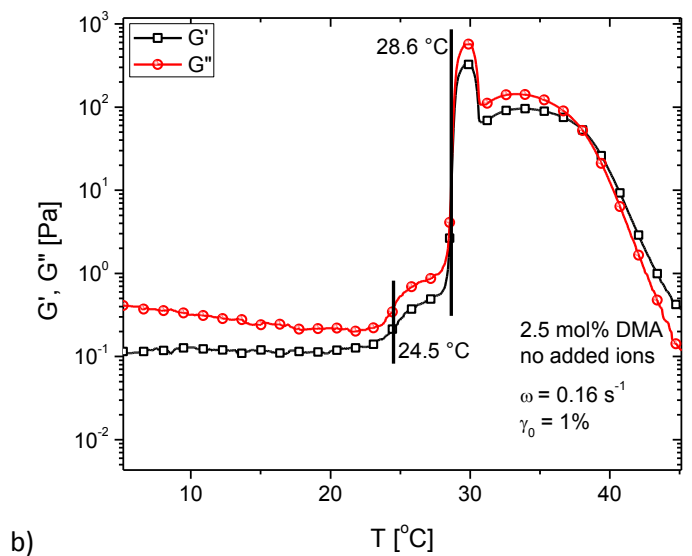
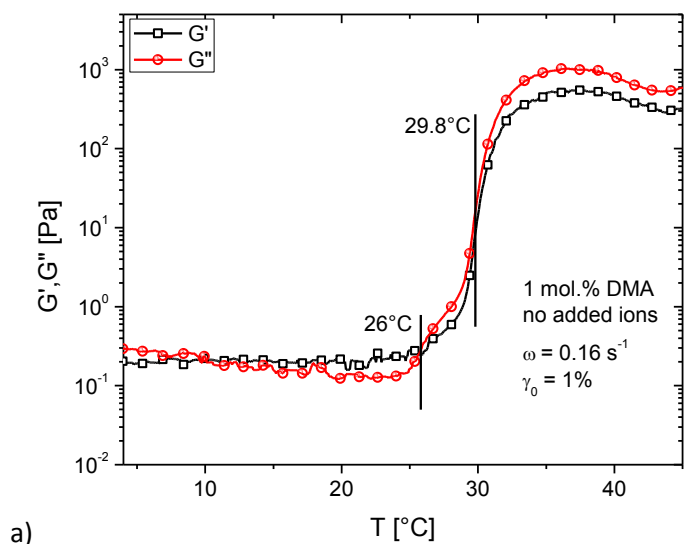
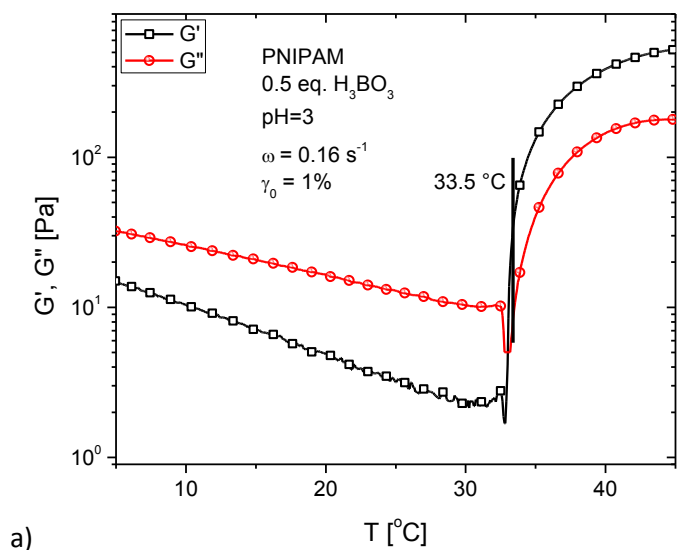
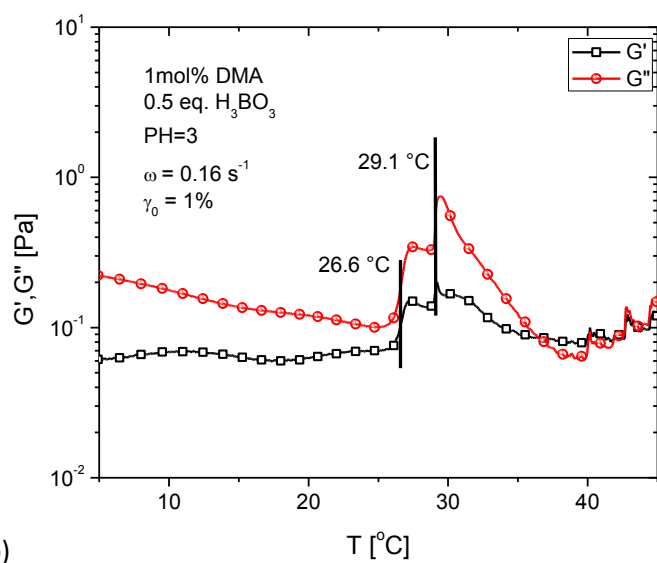


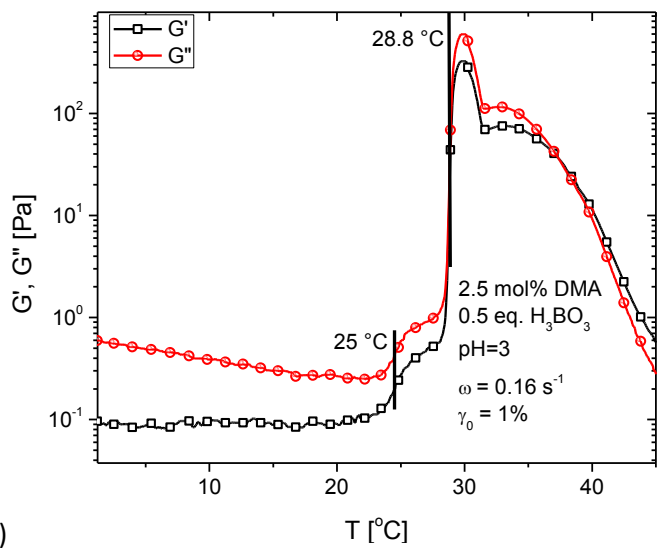
Figure S13: Temperature dependence of copolymer at pH=3 without added ions a) NIDO1% b) NIDO 2.5% c) NIDO 5%.



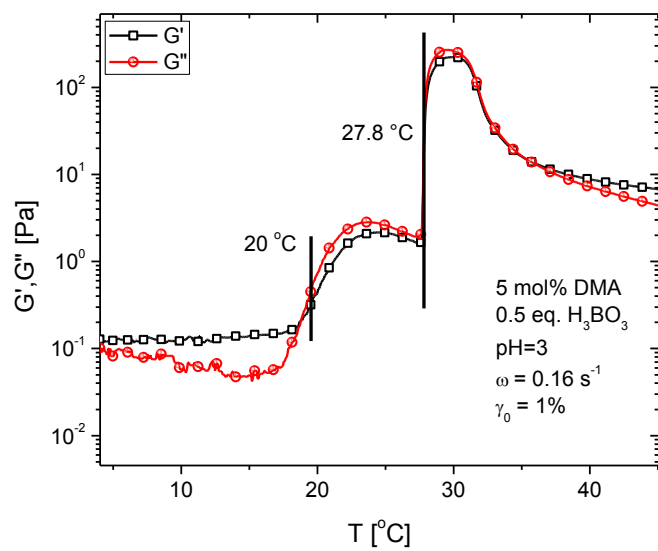
a)



b)



c)



d)

Figure S14: Temperature dependence of copolymer at pH=3 with 0.5 eq. H_3BO_3 a) PNIPAM, b) NIDO1%, c) NIDO 2.5%, d) NIDO 5%.