Electronic Supplementary Material (ESI) for Soft Matter

Thermo-responsive peptide-based triblock copolymer hydrogels

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KEYWORDS: Stimuli-responsive, polypeptide, triblock copolymers, hydrogels.

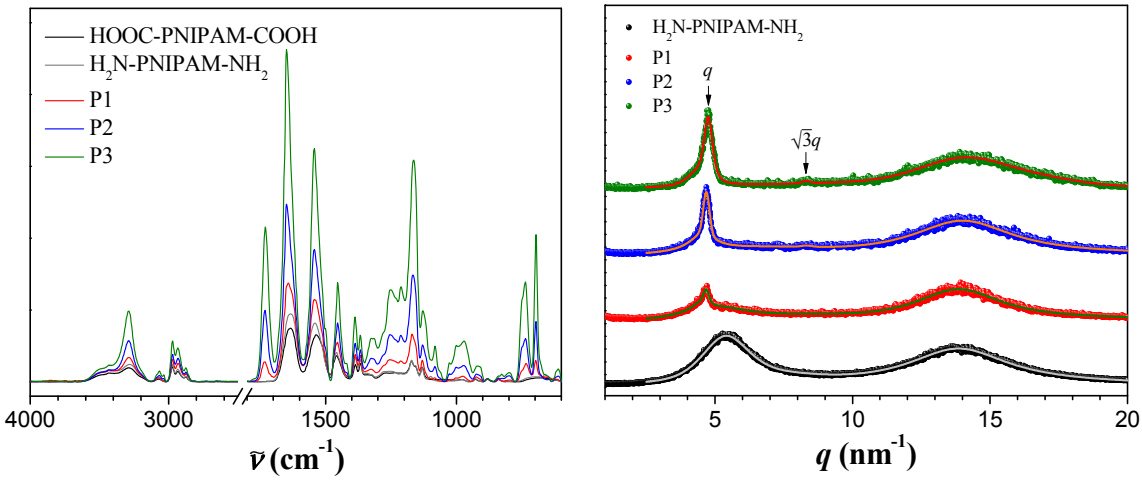

Figure ESI-1. FTIR spectra of the dicarboxy-terminated PNIPAM homopolymer, the diamino-terminated PNIPAM homopolymer, and the three PBLG-*b*-PNIPAM-*b*-PBLG triblock copolymers P1, P2 and P3 (left). WAXS patterns of the diamino-terminated PNIPAM homopolymer, and the three PBLG-*b*-PNIPAM-*b*-PBLG triblock copolymers P1, P2 and P3 (right).

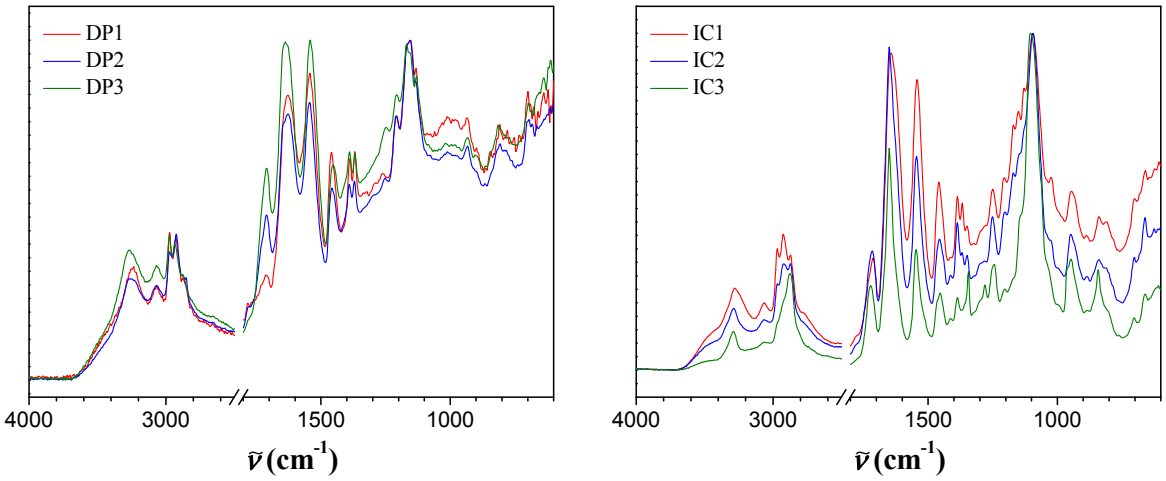

Figure ESI-2. FTIR spectra of the three PLGA-*b*-PNIPAM-*b*-PLGA triblock copolymers DP1, DP2 and DP3 (left), and FTIR spectra of the corresponding three ionic complexes IC1, IC2 and IC3 (right).

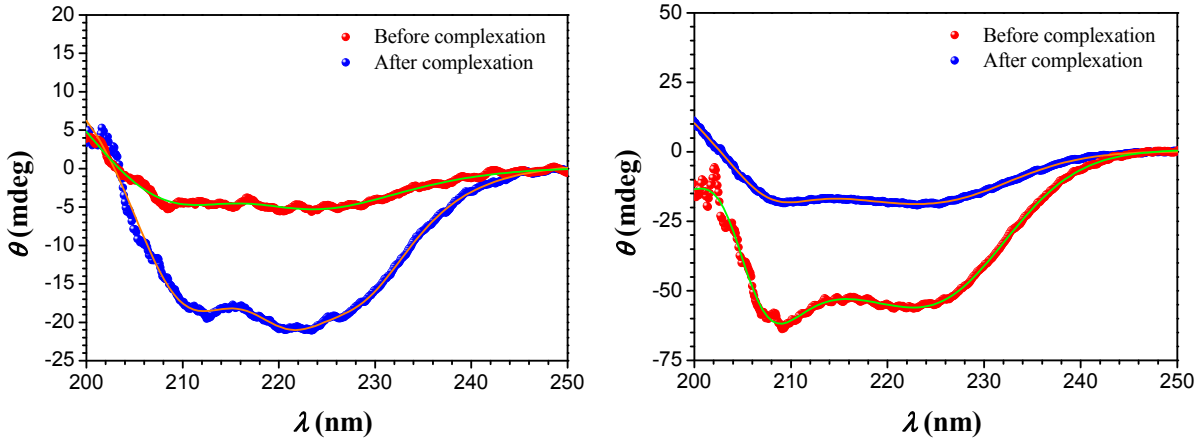

Figure ESI-3. Circular dichroism spectra of the two PLGA-*b*-PNIPAM-*b*-PLGA triblock copolymers DP1 (left) and DP2 (right) and their corresponding ionic complex IC1 (left) and IC2 (right).

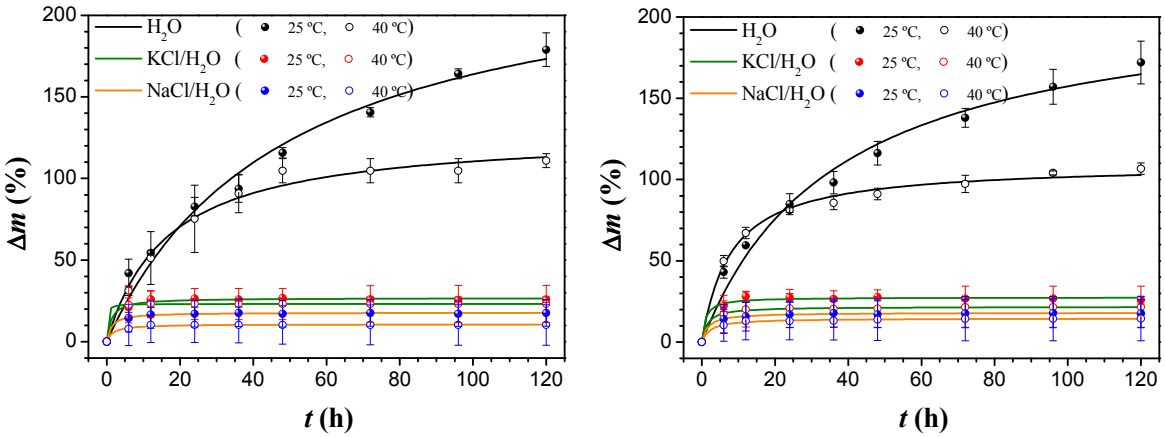

Figure ESI-4. Swelling behaviour of the two ionic complexes IC1 (left) and IC2 (right) at 25 ºC and 40 °C in water, KCl/water, and NaCl/water atmospheres.

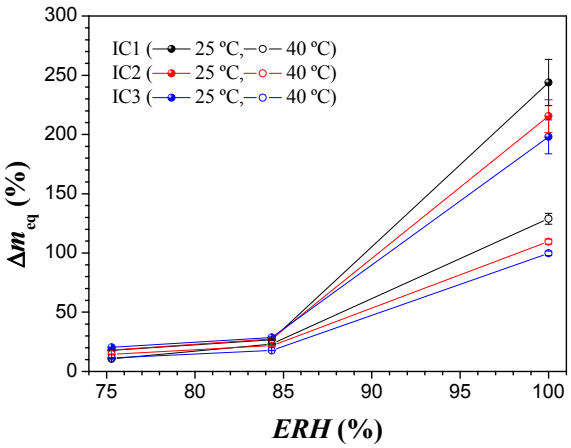

Figure ESI-5. Absolute equilibrium swelling ratio (Δm_{eq}) for the three ionic complexes IC1, IC2 and IC3 at 25 ºC (filled symbols) and 40 °C (empty symbols) in water (black symbols), KCl/water (red symbols), and NaCl/water (blue symbols) atmospheres.

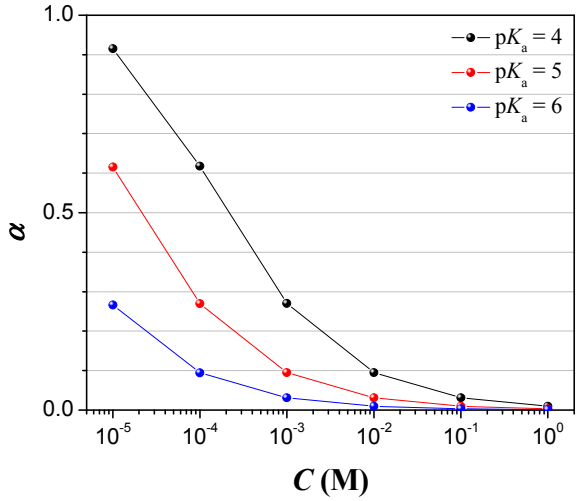

Figure ESI-6. Dissociation degree as function of the concentration for weak acids for different dissociation constants (pK_a).

Table ESI-1. Equilibrium swelling ratio (Δm_{eq}), swelling life time (τ), and swelling stretching factor (β) for the three ionic complexes IC1, IC2 and IC3 at 25 ºC and 40 °C in water atmosphere.

	***T* = 25 ºC**			***T* = 40 ºC**		
	Δm_{eq} (%)	**τ (h)**	**β**	**Δm_{eq} (%)**	**τ (h)**	**β**
IC1	244 ± 20	49.7 ± 0.4	0.88 ± 0.01	129 ± 5	22.2 ± 0.2	0.77 ± 0.01
IC2	215 ± 14	40.6 ± 0.3	0.85 ± 0.01	110 ± 2	12.1 ± 0.1	0.69 ± 0.01
IC3	198 ± 14	37.8 ± 0.3	0.84 ± 0.01	100 ± 2	24.2 ± 0.2	0.78 ± 0.01

Table ESI-2. Equilibrium swelling ratio (Δm_{eq}), swelling life time (τ), and swelling stretching factor (β) for the three ionic complexes IC1, IC2 and IC3 at 25 ºC and 40 °C in KCl/water atmosphere.

	***T* = 25 ºC**			***T* = 40 ºC**		
	Δm_{eq} (%)	**τ (h)**	**β**	**Δm_{eq} (%)**	**τ (h)**	**β**
IC1	26.7 ± 0.5	1.95 ± 0.03	0.51 ± 0.01	23.2 ± 0.1	1.95 ± 0.03	0.52 ± 0.01
IC2	27.5 ± 0.5	1.48 ± 0.03	0.49 ± 0.01	21.7 ± 0.2	2.33 ± 0.04	0.53 ± 0.01
IC3	28.7 ± 0.4	3.3 ± 0.1	0.56 ± 0.01	17.7 ± 0.2	1.90 ± 0.03	0.51 ± 0.01

Table ESI-3. Equilibrium swelling ratio (Δm_{eq}), swelling life time (τ), and swelling stretching factor (β) for the three ionic complexes IC1, IC2 and IC3 at 25 ºC and 40 °C in NaCl/water atmosphere.

	T = 25 ºC			T = 40 ºC		
	Δm_{eq} (%)	τ (h)	β	Δm_{eq} (%)	τ (h)	β
IC1	17.8 ± 0.2	2.00 ± 0.04	0.52 ± 0.01	10.7 ± 0.2	2.71 ± 0.04	0.54 ± 0.01
IC2	18.1 ± 0.2	2.71 ± 0.04	0.54 ± 0.01	14.5 ± 0.2	3.80 ± 0.05	0.57 ± 0.01
IC3	20.4 ± 0.3	3.00 ± 0.05	0.55 ± 0.01	11.5 ± 0.1	2.91 ± 0.05	0.55 ± 0.01