

Article

Polymer networks for enrichment of calcium ions

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Supplementary Material

Figure S1. ATR-FTIR cell for monitoring the UV polymerization in solution.

Figure S2. Photorheological investigation of the poly(ECPA-*co*-BNEAA) gel formation prepared in different solvents and with various crosslinker contents.

Figure S3. Titration curves (a) of (1) poly(ECPA-*co*-BNEAA) (10/10), (2) poly(ECPA) and (3) ECPA with NaOH and (b) poly(ECPA) in NaOH and Ca(OH)₂ for comparison with: (1) first titration with NaOH, (2) second titration with NaOH, (3) first titration with Ca(OH)₂, (4) second titration with Ca(OH)₂, (5) back titration with HCl after NaOH and (6) back titration with HCl after Ca(OH)₂.

Figure S4. Double diffusion cell in open state (left) and closed state (right).

Table S1. Monomer Feed Compositions for the Synthesized poly(ECPA-*co*-BNEAA) gels with 80 wt.% solvent and 0.5 wt.% TPO as initiator based on the total mass.

Table S2. Influence of monomer (ECPA)/crosslinker (BNEAA) ratio and solvent on the formation of macroscopic gels.

Table S3. Storage moduli G' of the photorheologically investigated monomer mixtures or polyelectrolyte gels formed from them.

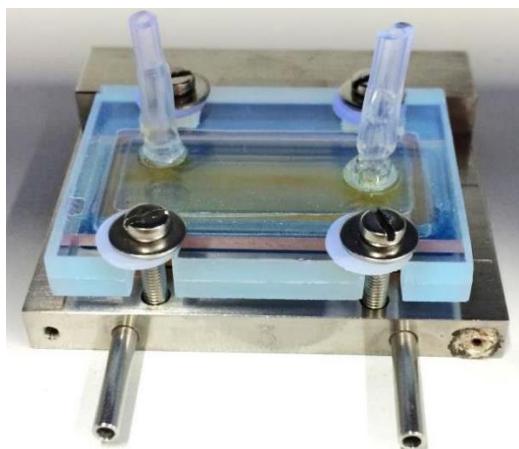


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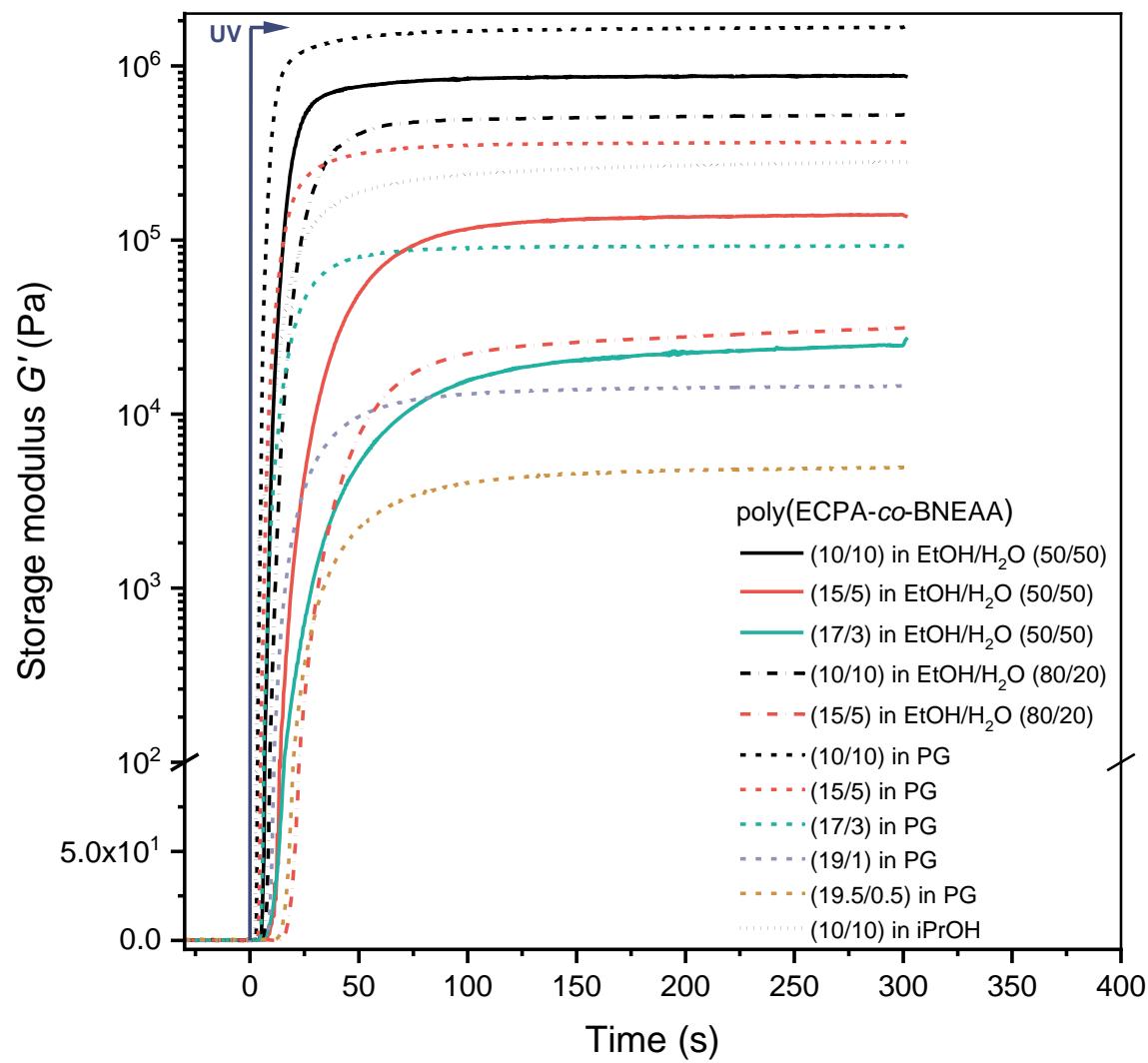


Figure S2. Photorheological investigation of the poly(ECPA-co-BNEAA) gel formation prepared in different solvents and with various crosslinker contents.

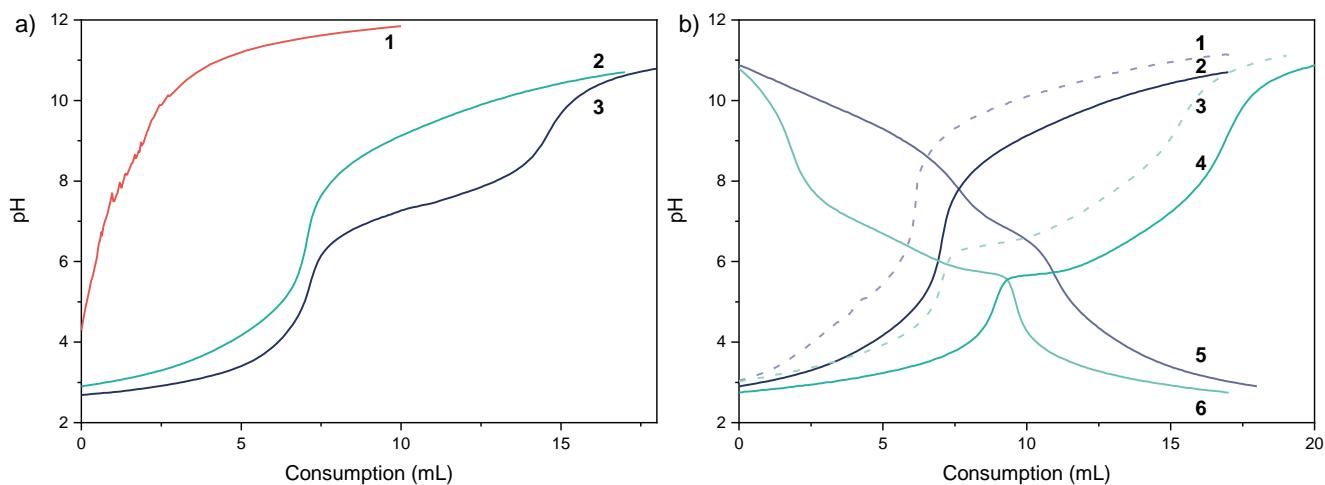


Figure S3. Titration curves (a) of (1) poly(ECPA-*co*-BNEAA) (10/10), (2) poly(ECPA) and (3) ECPA with NaOH and (b) poly(ECPA) in NaOH and Ca(OH)₂ for comparison with: (1) first titration with NaOH, (2) second titration with NaOH, (3) first titration with Ca(OH)₂, (4) second titration with Ca(OH)₂, (5) back titration with HCl after NaOH and (6) back titration with HCl after Ca(OH)₂.



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Table S1. Monomer Feed Compositions for the Synthesized poly(ECPA-*co*-BNEAA) gels with 80 wt.% solvent and 0.5 wt.% TPO as initiator based on the total mass.

| Poly(ECPA- <i>co</i> -BNEAA) | ECPA (wt.%) | BNEAA (wt.%) |
|------------------------------|-------------|--------------|
| 10/10 | 10 | 10 |
| 15/5 | 15 | 5 |
| 17/3 | 17 | 3 |
| 18/2 | 18 | <u>2</u> |
| 19/1 | 19 | 1 |
| 19.5/0.5 | 19.5 | 0.5 |

Table S2. Influence of monomer (ECPA)/crosslinker (BNEAA) ratio and solvent on the formation of macroscopic gels after UV irradiation for 60 s.

| Ratio of ECPA/BNEAA in solution (wt.%) | Solvent | | | |
|---|------------------|-------------------------------|----------------------------|------------------|
| | PG | EtOH/H ₂ O (50/50) | iPrOH | DMSO |
| 10/10 | Gel, firm | Gel, firm | Gel, firm | Gel, firm |
| 15/5 | Gel, firm | Gel, medium | Gel, firm | Gel, medium |
| 16/4 | | Gel, soft | | Gel, soft |
| 17/3 | Gel, firm | Gel, soft | Gel, soft | Gel, very soft |
| 17/3 | Gel | <u>Gel, soft</u> | | Gel, soft |
| 18/2 | Gel | No gel | | <u>Gel, soft</u> |
| 19/1 | Gel, medium | No gel | Gel, very soft | No gel |
| 19.5/0.5 | <u>Gel, soft</u> | | Gel, very soft | |
| 19.9/0.1 | No gel | | <u>Gel, extremely soft</u> | |

Table S3. Storage moduli G' of the photorheologically investigated monomer mixtures or polyelectrolyte gels formed from them.

| Solvent | Ratio of ECPA/BNEAA in solution (wt.%) | | | | | |
|------------------------------------|--|------|------|------|----------|------|
| | 10/10 | 15/5 | 17/3 | 19/1 | 19.5/0.5 | 20/0 |
| Maximum Storage modulus G' (kPa) | | | | | | |
| PG | 1660 | 364 | 93 | 14 | 5 | |
| EtOH/H ₂ O (50/50) | 881 | 139 | 25 | | | |
| EtOH/H ₂ O (80/20) | 522 | 31 | | | | a) |
| iPrOH | 282 | a) | a) | | | |

^{a)}Gel formation not rheologically detectable.