Electronic Supplementary Material (ESI) for Materials Advances.


# Supporting Information

## 4D-printed hydrogels based on poly(oxazoline) and poly(acrylamide) copolymers by stereolithography

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**Supplementary Table**

| Hydrogels | G' (Pa) | ξ (Å) |
|---|---|---|
| **PMOx$_{20}$-*net*-PNIPAM$_4$** | 44 | 473 |
| **PMOx$_{20}$-*net*-PNIPAM$_{100}$** | 29 | 542 |
| | | |
| **PiPrOx$_{20}$-*net*-PAM$_4$** | 173 | 299 |
| **PiPrOx$_{20}$-*net*-PAM$_{100}$** | 115 | 342 |

**Table S1.** Storage modulus in the linear viscoelastic domain and mesh size for the hydrogels at equilibrium at 20°C.

**Supplementary Figures**

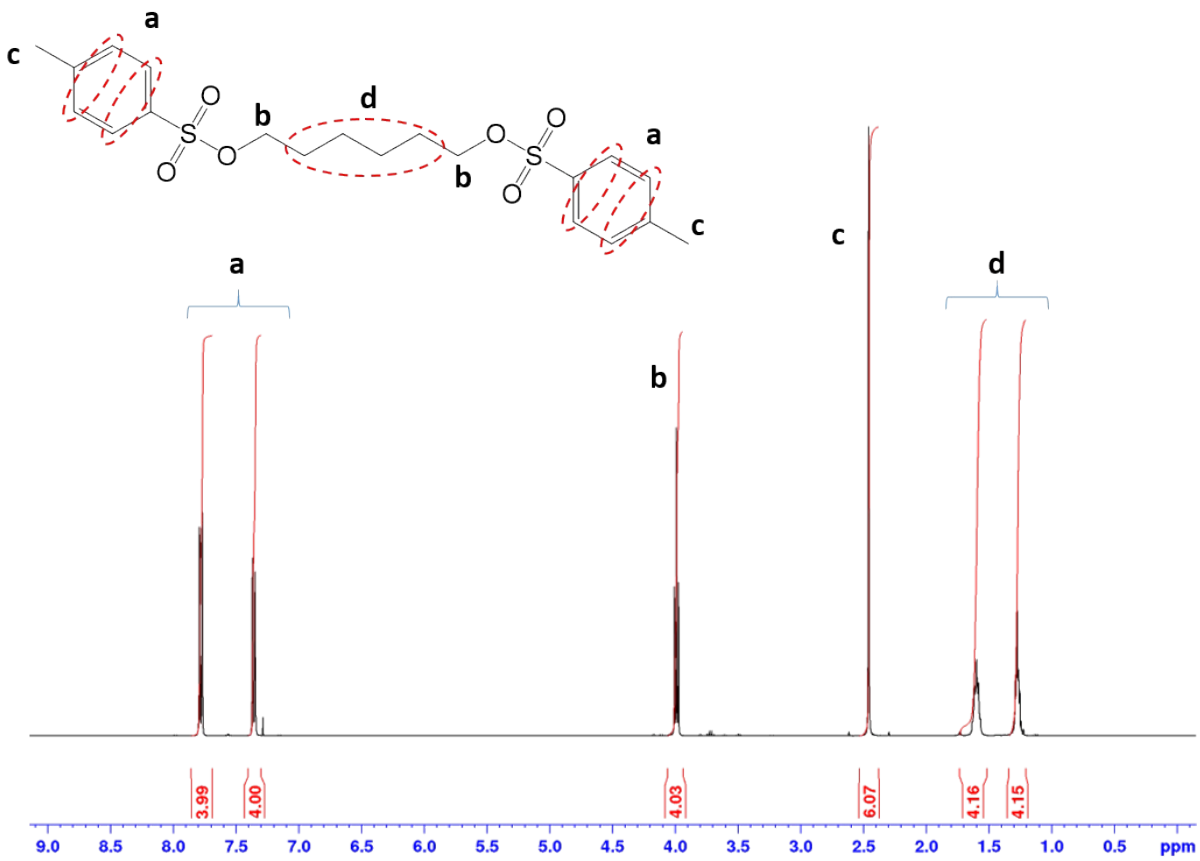



**Figure S1.** $^{1}$H NMR spectrum of the synthesized 1,6-hexaneditosylate (HDOTs).

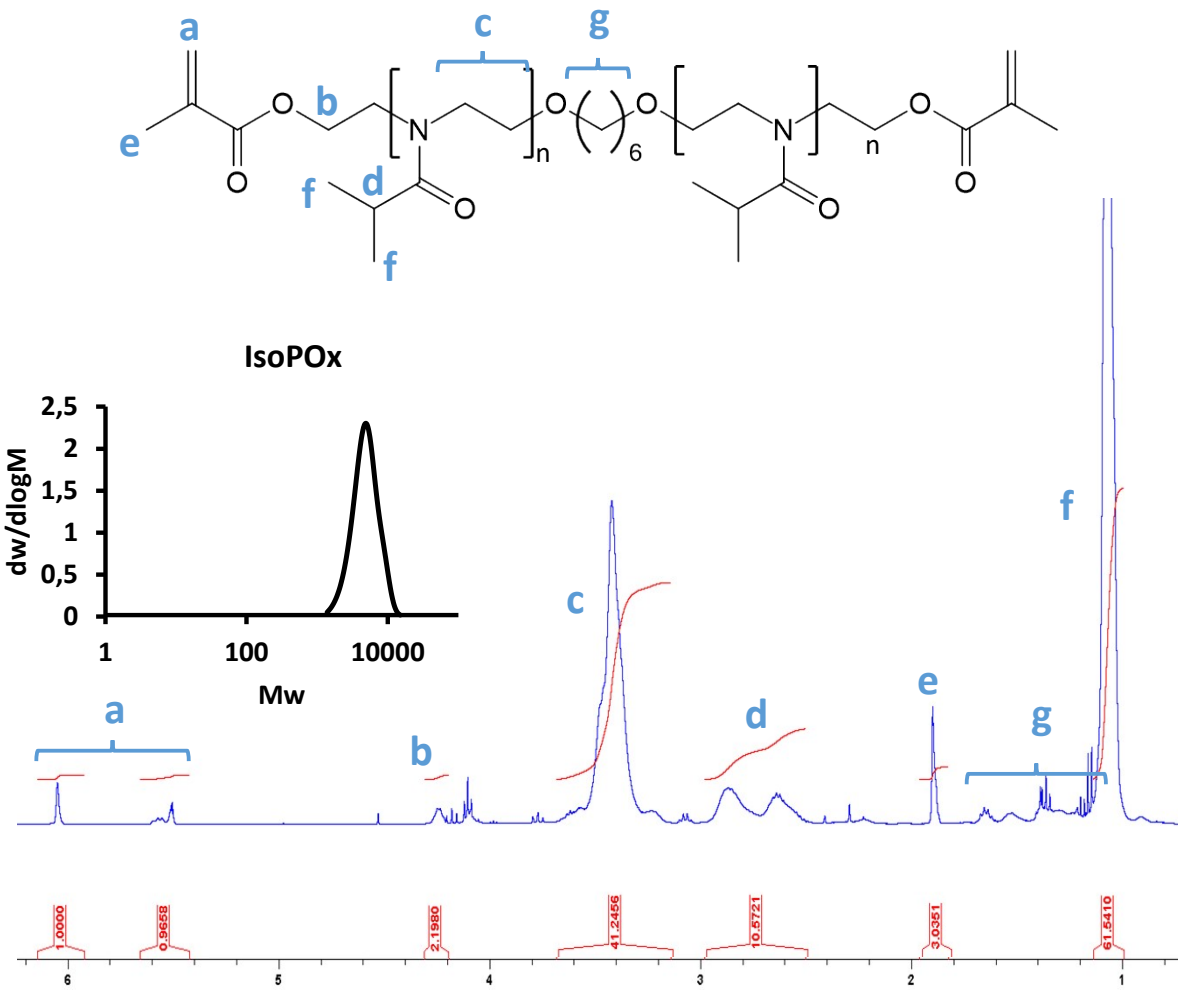



**Figure S2.** Size Exclusion Chromatography spectrum and $^{1}H$ NMR spectrum of the synthesized poly(2-isopropyl-2-oxazoline) (PiPrOx), $DP_n$ = 20.

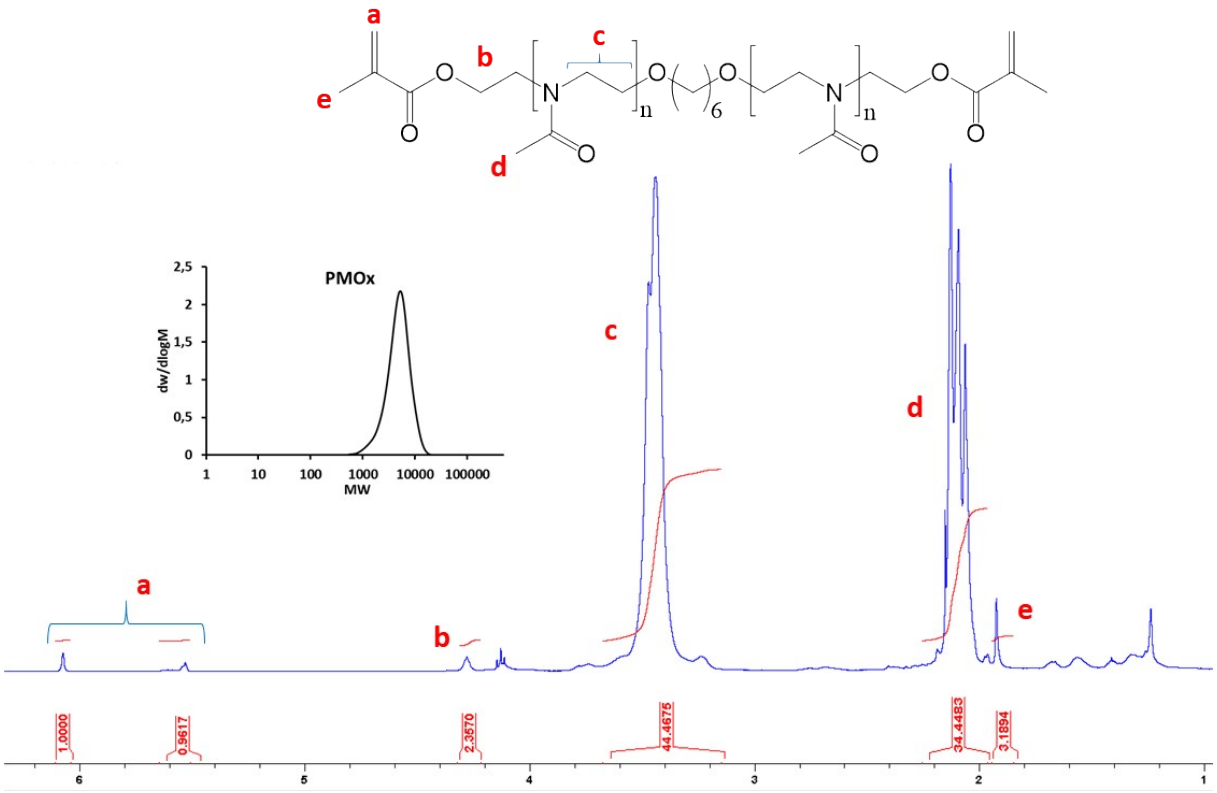
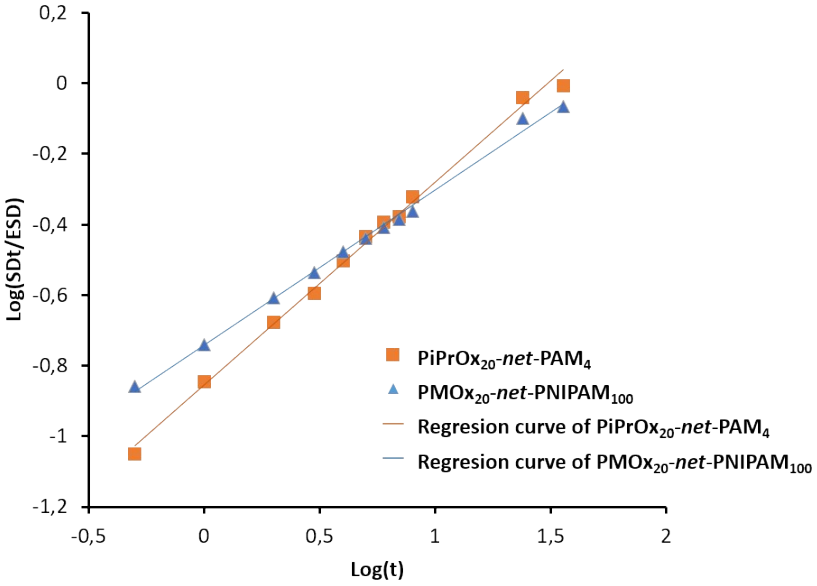



**Figure S3.** Size Exclusion Chromatography spectrum and $^{1}$H NMR spectrum of the synthesized poly(2-methyl-2-oxazoline) (PMOx), $DP_n$ = 20.

**Figure S4.** Picture of the swollen thermo-responsive hydrogels PiPrOx$_{20}$-*net*-PAM$_4$ (left) and PMOx$_{20}$-*net*-PNIPAM$_{100}$ (right) at the equilibrium at 20°C.




| | $PiPrOx_{20}$-*net*-$PAM_4$ | $PMOx_{20}$-*net*-$PNIPAM_{100}$ |
|---|---|---|
| *n* | 0.6 | 0.43 |
| $R^2$ | 0.9956 | 0.996 |
| $k.10^{-2}$ | 10.9 | 18.6 |

**Figure S5.** Diffusion mechanism of the thermo-responsive hydrogels $PiPrOx_{20}$-*net*-$PAM_4$ and $PMOx_{20}$-*net*-$PNIPAM_{100}$ using the Ritger-Peppas model.

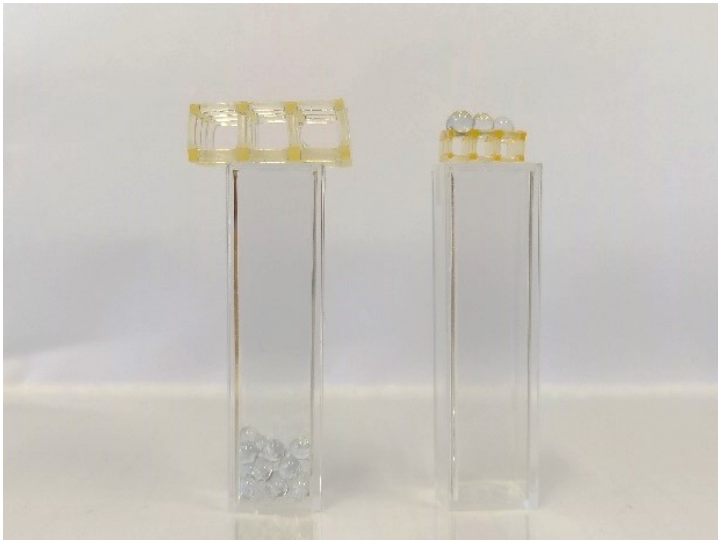


**Figure S6.** Illustrative picture of the thermo-sensitivity of the PiPrOx$_{20}$-*net*-PAM$_4$, with the hydrogel in this swollen state at 20 °C (left), where the beads can fall down through the device, and the hydrogel in the collapsing state at 50 °C (right), where the beads cannot go through the device.

**Supplementary Movies**

**Movie S1.** Mechanical performance of 4D printed device based on PMOx$_{20}$-*net*-PNIPAM$_{100}$ in swollen state.

**Movie S2.** Mechanical performance of 4D printed device based on PiPrOx$_{20}$-*net*-PAM$_4$ in swollen state.

**Movie S3.** 4D printed device based on PiPrOx$_{20}$-*net*-PAM$_4$ with golden beads release.