Supplementary Information (SI) for Soft Matter.

Photo-Crosslinked Pluronic Hydrogels: Micelle Self-assembly and Thermoresponsive Behavior

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Dynamic Light Scattering (DLS)

Particle size measurements were performed on a nanoparticle size analyzer (NANO ZS Malvern). The Pluronic solutions concentrations were optimized by continuous dilutions by a factor of 2 starting from a 10% w/v until the peak of interest disappears at 5 °C. The concentration was then fixed at 2.5% w/v and size measurements were done between 5 °C and 65 °C. The laser power, time interval, and number of channels were adjusted for each sample to obtain a good auto-correlation curve. The presented results are the average of three measurements.

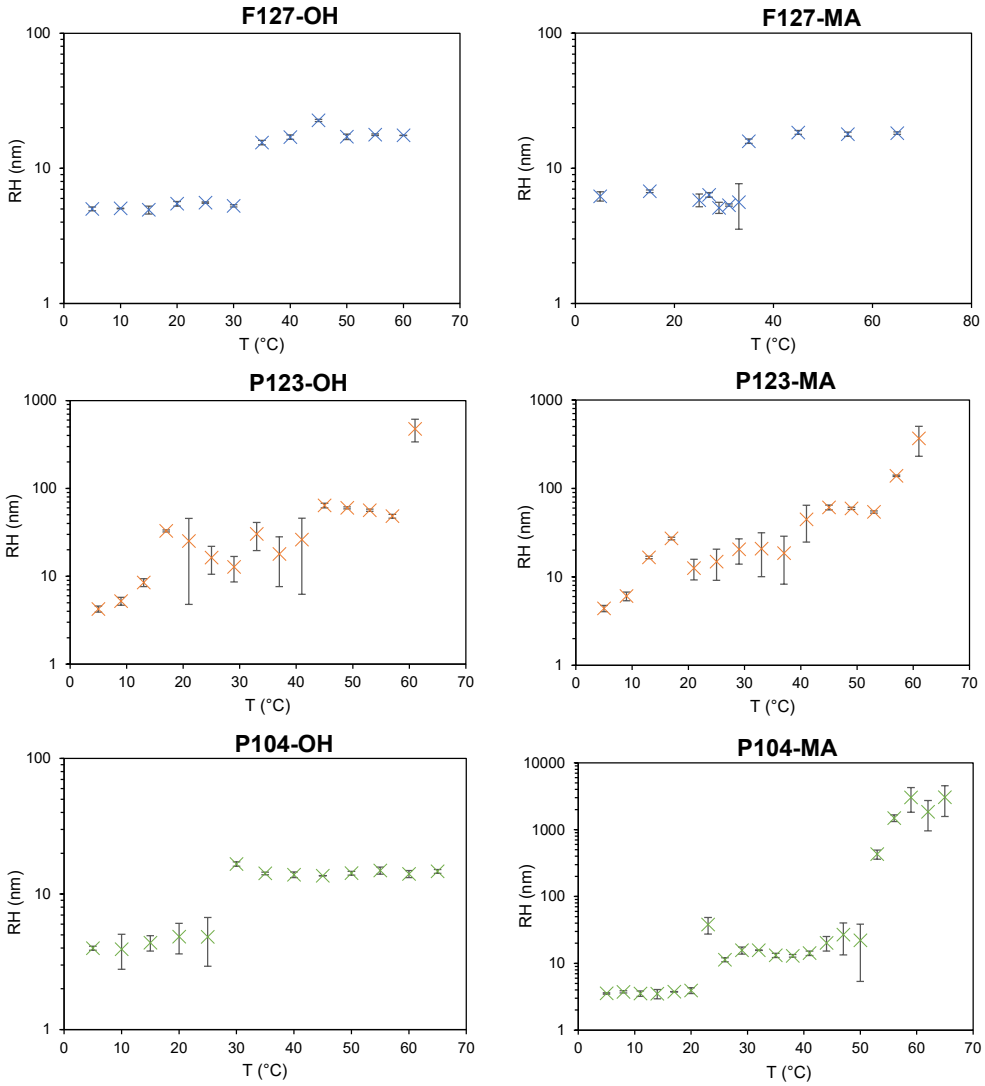

Figure S1. Hydrodynamic radius (R_H) as obtained by dynamic light scattering for F127-OH, F127-MA, P123-OH, P123-MA, P104-OH and P104-MA at different temperatures for 2.5% w/w solutions.

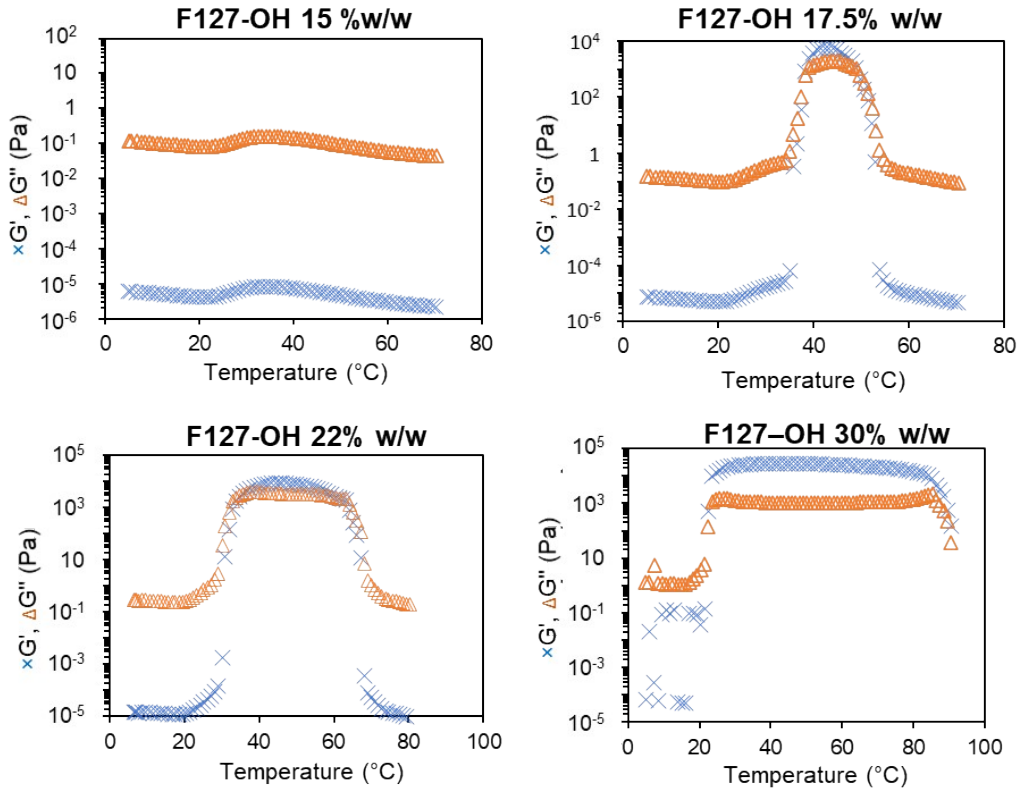

Figure S2. Storage and loss modulus as function of temperature variation for F127-OH at various concentrations.

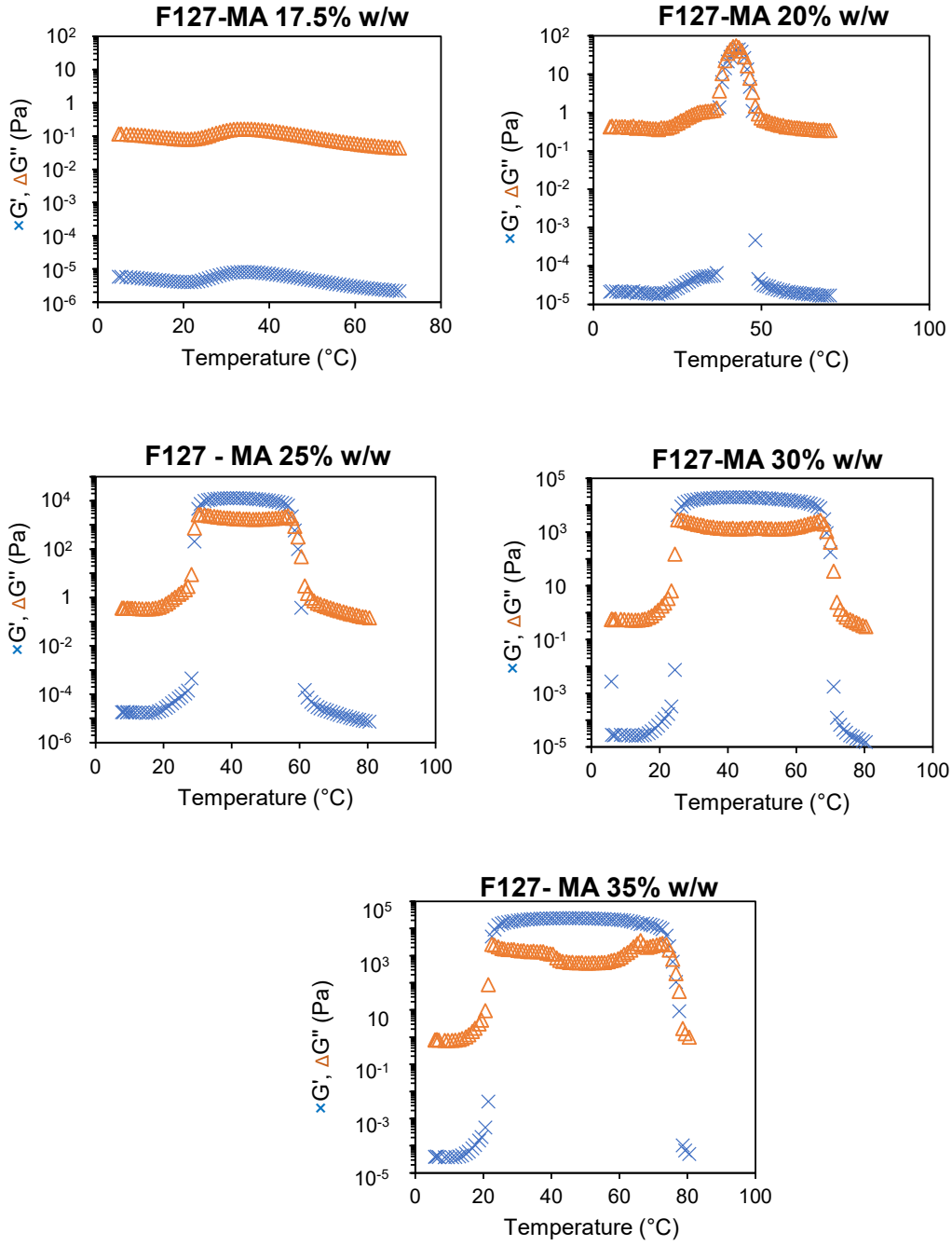

Figure S3. Storage and loss modulus as function of temperature variation for F127-MA at various concentrations.

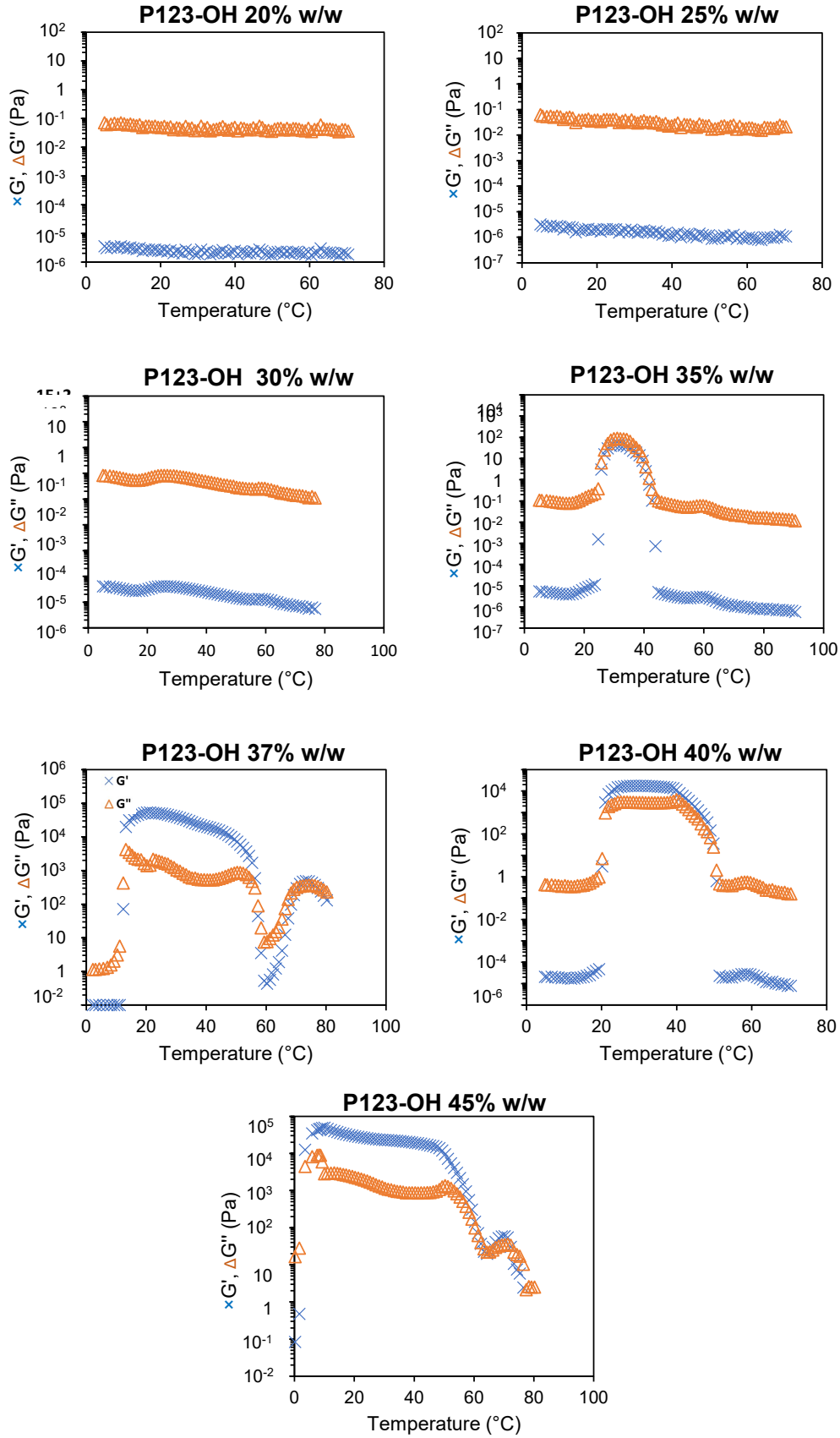

Figure S4. Storage and loss modulus as function of temperature variation for P123-OH at various concentrations.

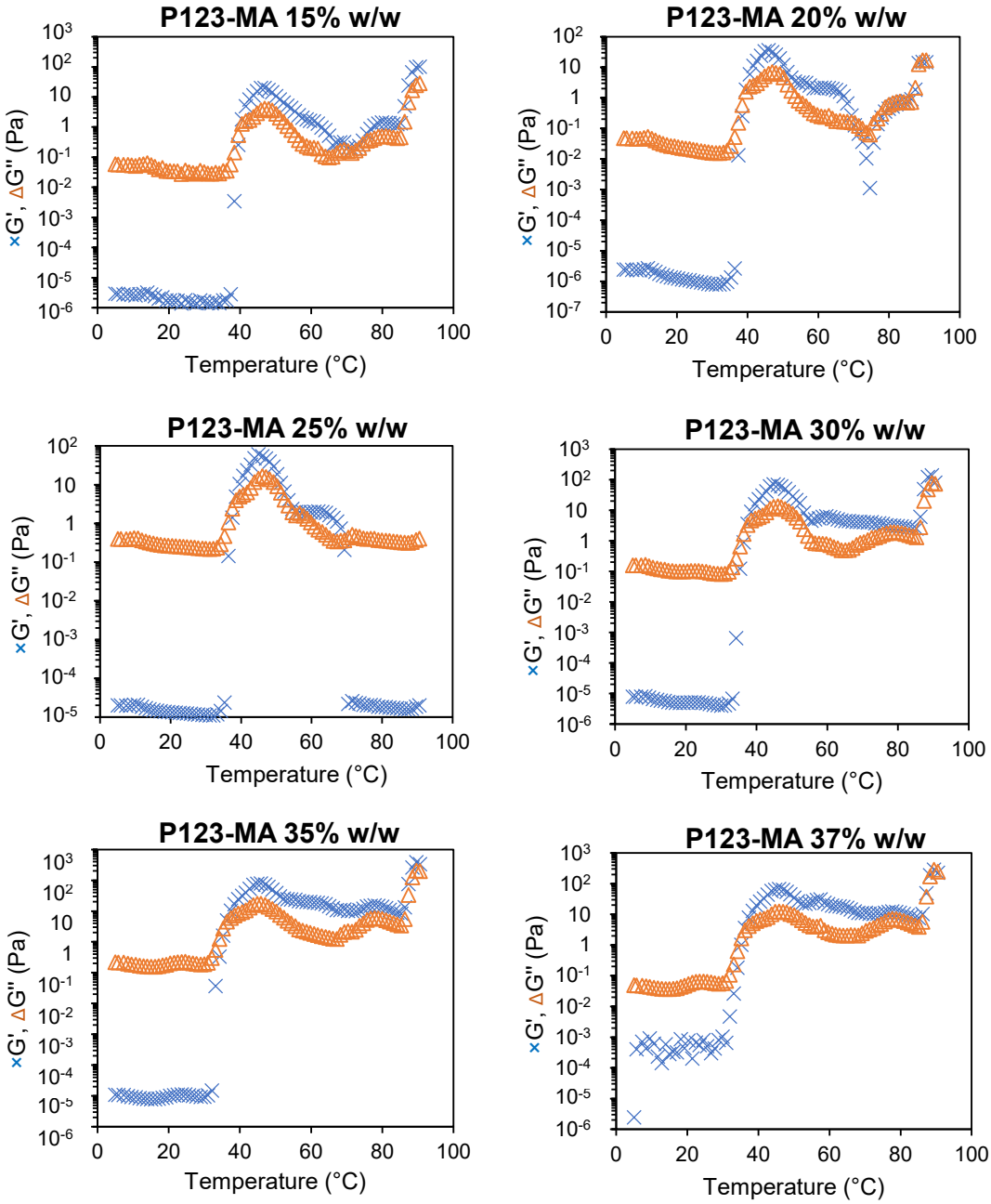

Figure S5. Storage and loss modulus as function of temperature variation for P123-MA at various concentrations.

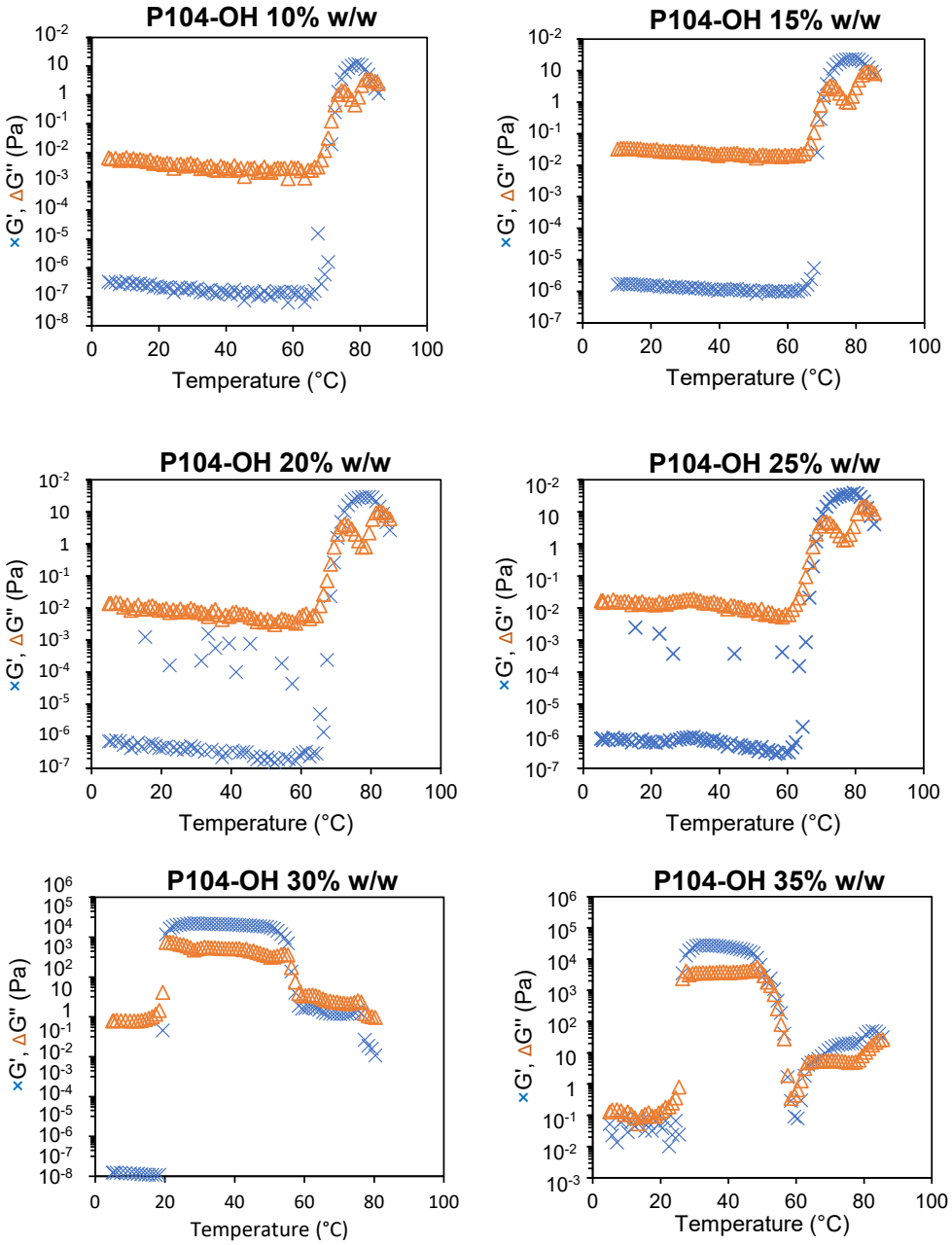

Figure S6. Storage and loss modulus as function of temperature variation for P104-OH at various concentrations.

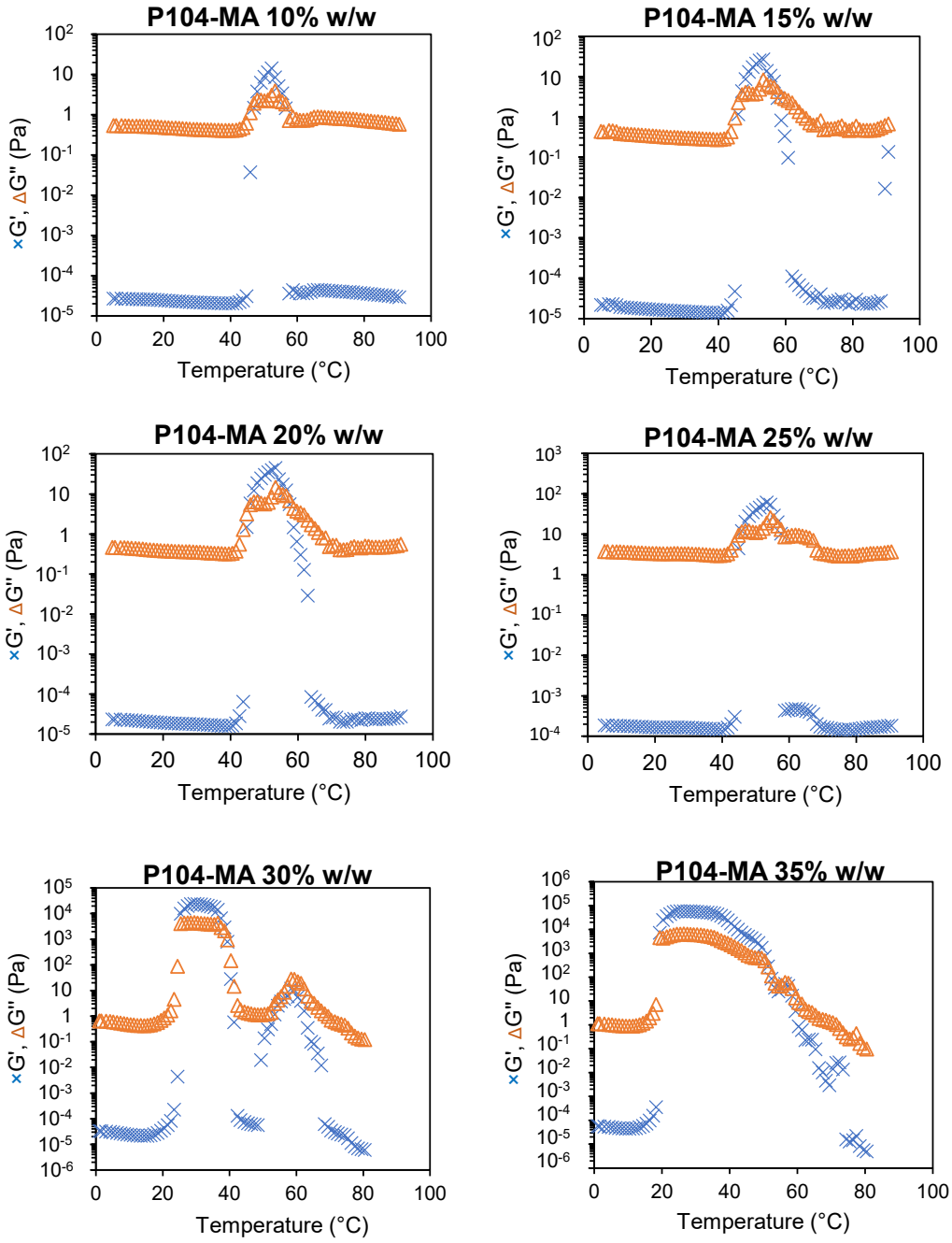

Figure S7. Storage and loss modulus as function of temperature variation for P104-MA at various concentrations.

Figure S8. Physical aspect of P123-MA solutions at 15% w/w (left) and 30% w/w (right) when heated to 70 °C.

Gel content (GC)

For this study hydrogels were used directly after UV curing. Upon photo-crosslinking, the hydrogels were dried under vacuum for 24 h then we recorded the mass denoted $m_{dry\ 1}$. Then the hydrogels were left to swell in water for 24 h (changing the water twice) at 10 °C then 24 h at 50 °C recording the mass at each point. Finally, the hydrogels were dried and the recorded mass was denoted by $m_{dry\ 2}$. The gel content (GC) was calculated using the following equation.

$$GC = 100 * \frac{m_{dry\ 1}}{m_{dry\ 2}} \qquad \text{(Equation S1)}$$

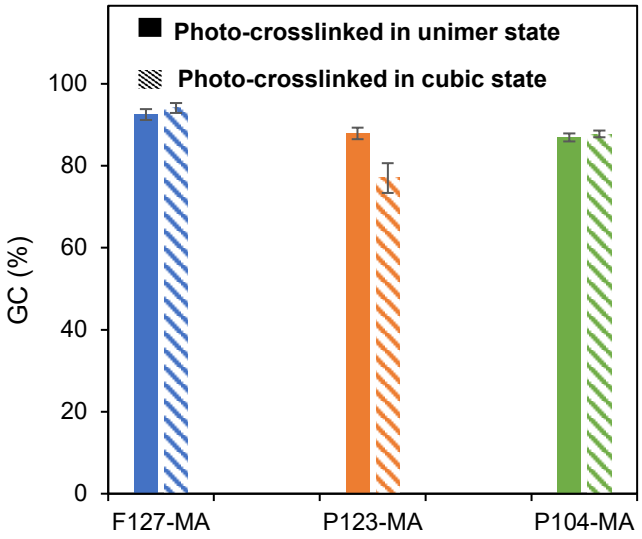

Figure S9. Gel content of F127-MA, P123-MA and P104-MA hydrogels at 25% w/w when photo-crosslinked in the unimer and cubic state.

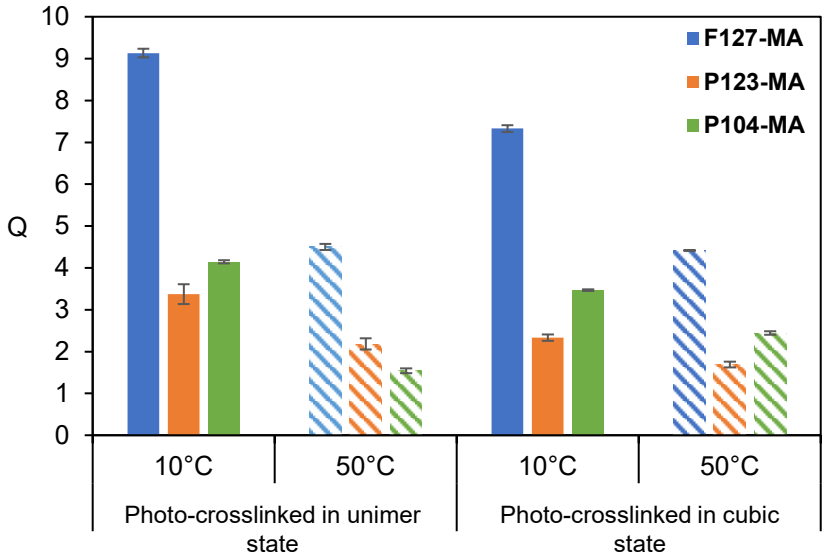

Figure S10. Swelling degree of F127-MA, P123-MA and P104-MA hydrogels at 25% w/w when photo-crosslinked in the unimer and cubic when swollen in water at 10 °C and 50 °C.