

ELECTRONIC SUPPORTING INFORMATION

Detailed GPC Analysis of Poly(*N*-isopropylacrylamide) with Core Cross-linked Star Architecture

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1. Arm Conversion Calculation

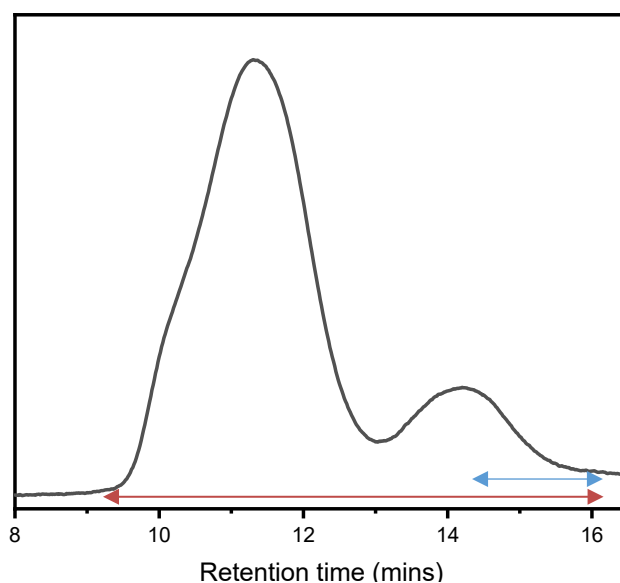


Figure S1: Example arm conversion calculation utilising the GPC RI trace. The example shown is for **P3** (85% conversion).

$$\% \text{ Conversion} = 100 - \left(\frac{2(\text{blue area})}{\text{red area}} \times 100 \right)$$

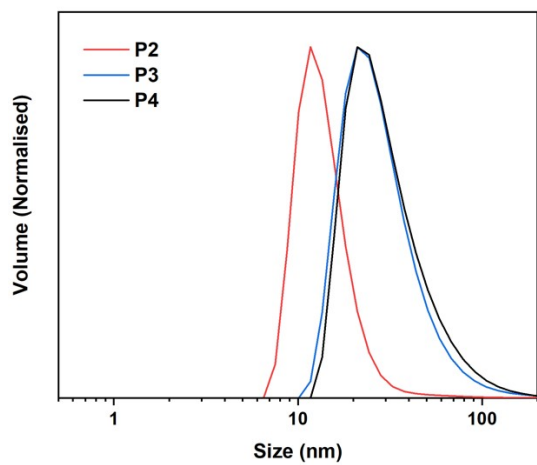
The above equation was used to estimate the arm conversion for the star polymers using the refractive index detector response.

Assumptions:

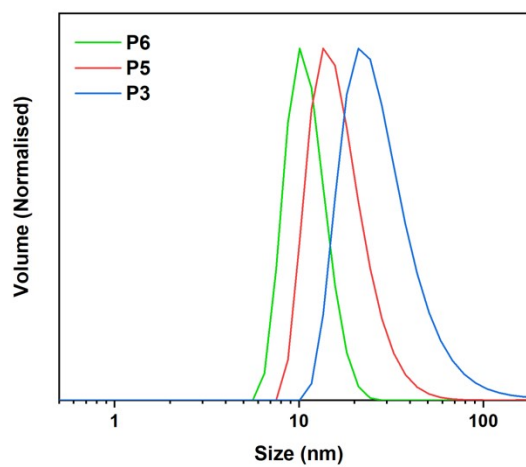
- 1) The left over arm peak is Gaussian in nature
- 2) $\frac{dn}{dc}$ is the same or similar for both the arm and star polymer

2. DLS Measurements of the Star Polymers

A



B



C

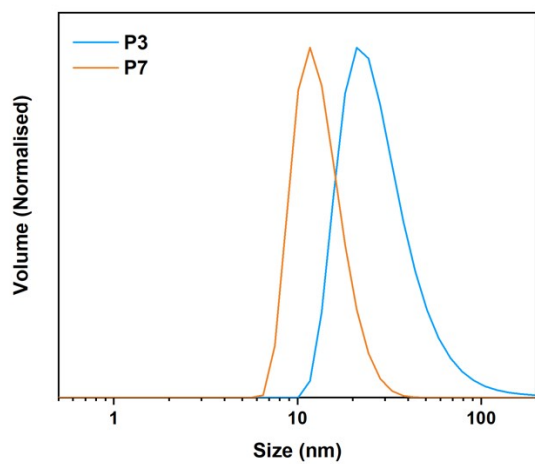


Figure S2: DLS measurements of the star crosslinked polymers in DMF: (A) stars with different core size, (B) stars with different arm length and (C) stars with different crosslinker.

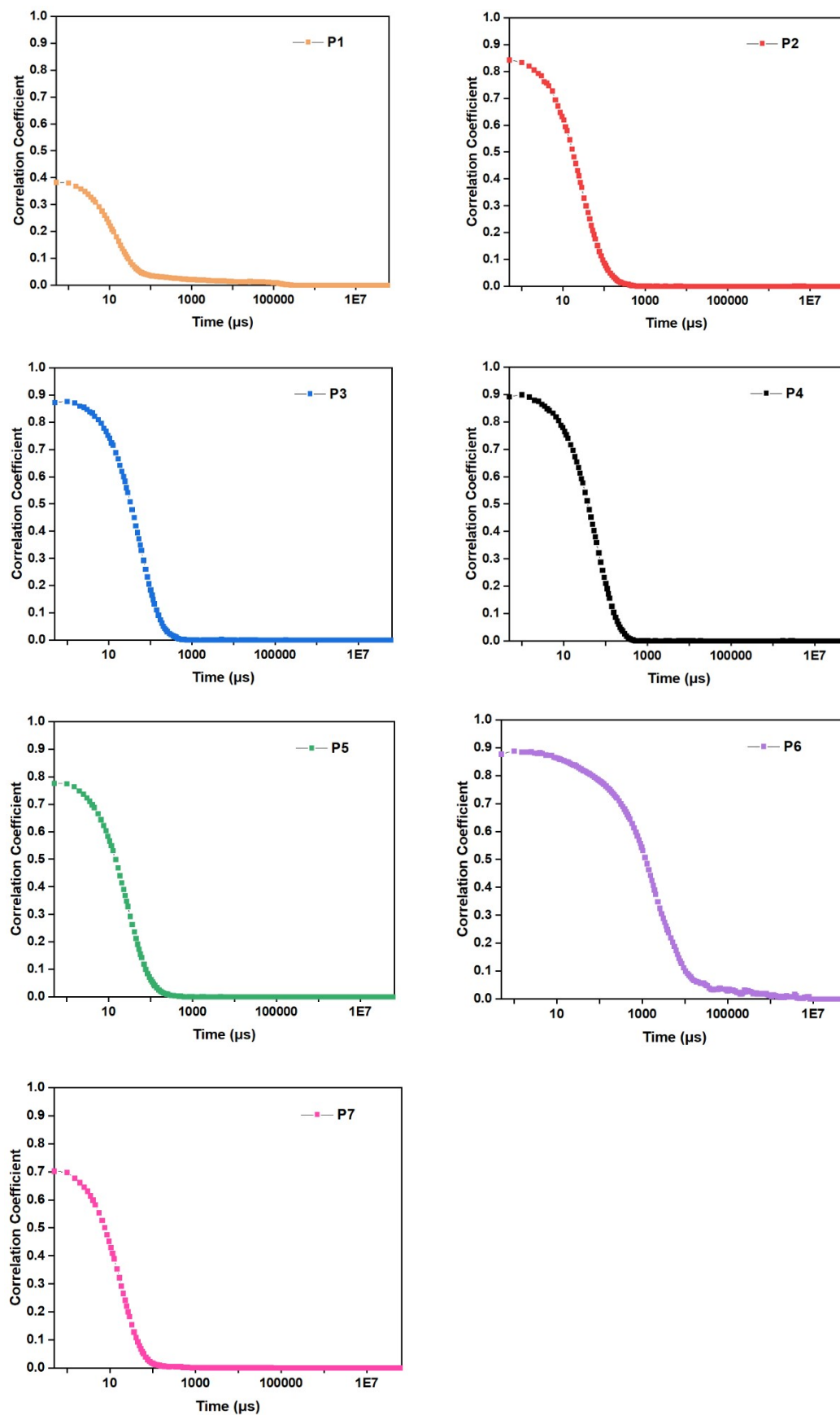


Figure S3: Plots of the correlation function of the star polymers.

3. Combined Mark-Houwink Plots for All Polymers Studied

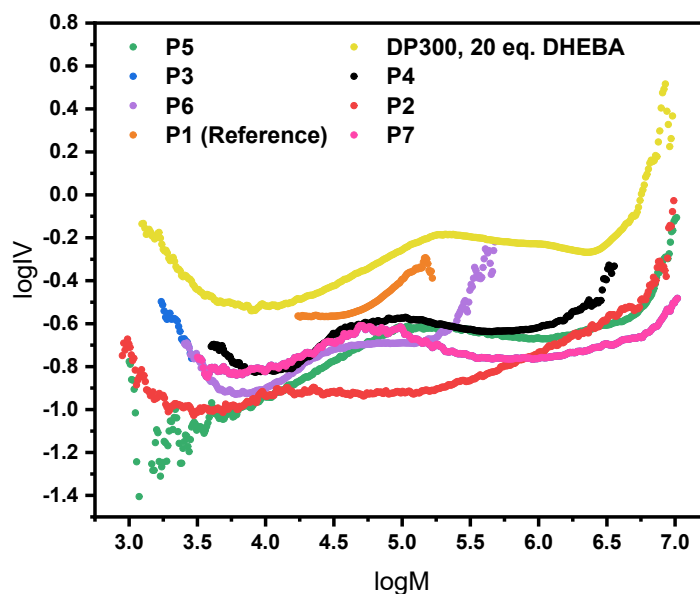


Figure S4: Combined Mark-Houwink plots for **P1-P7**. Included is the reference used for the functionality calculations (**P1**). Note that a DP300, 20eq. of DHEBA is also included but was excluded from the main results due to the partial solubility. This affected the results by giving it a higher IV than reality.

4. Combined g' plots for P2-P7

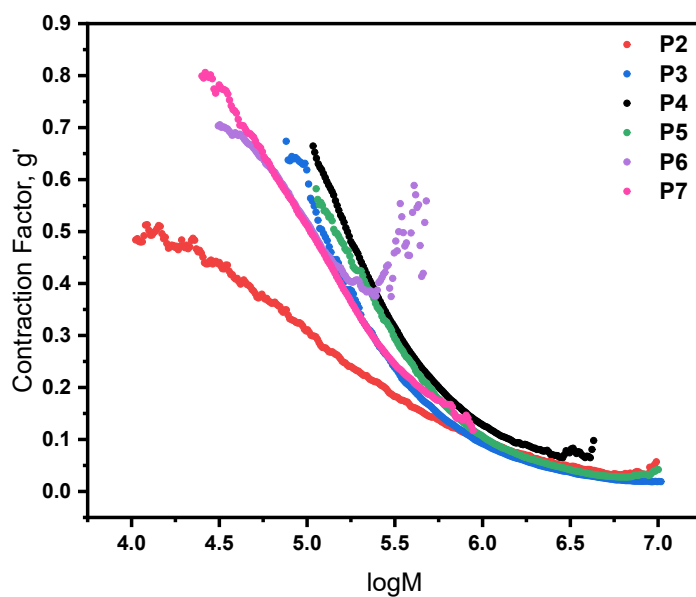


Figure S5: g' plots for **P2-P7** as calculated using equation 3. Higher g' values corresponds to fewer arms

5. Overlaid Distribution and Mark-Houwink Plots

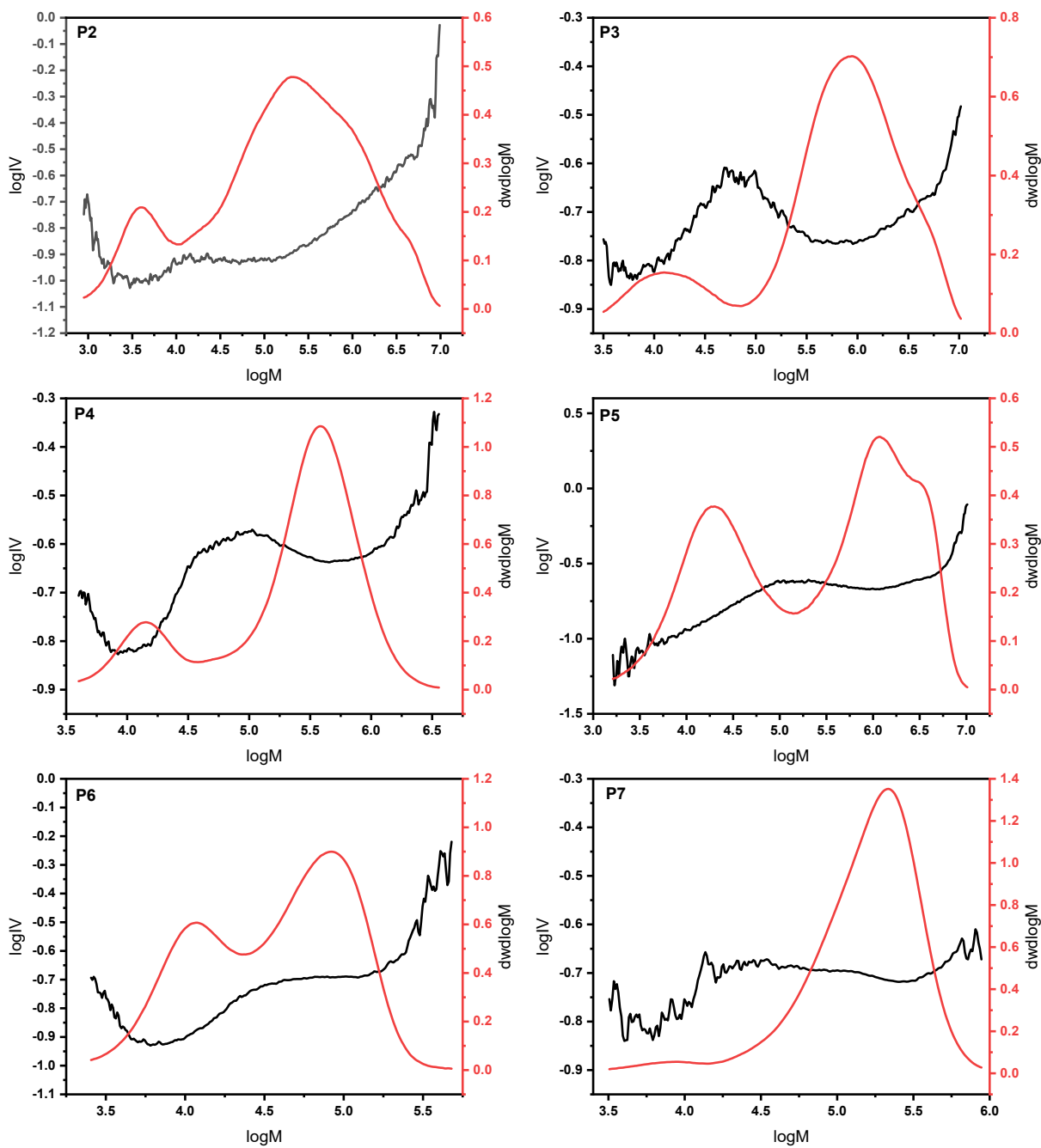


Figure S6: Distribution plots overlaid with the Mark-Houwink plots for **P2-P7**. These plots confirm the linear region is left over arms/dimers and show where the IV lies in the distribution.