

Synthesis and Characterization of Foldamer-Based Polymer Networks.

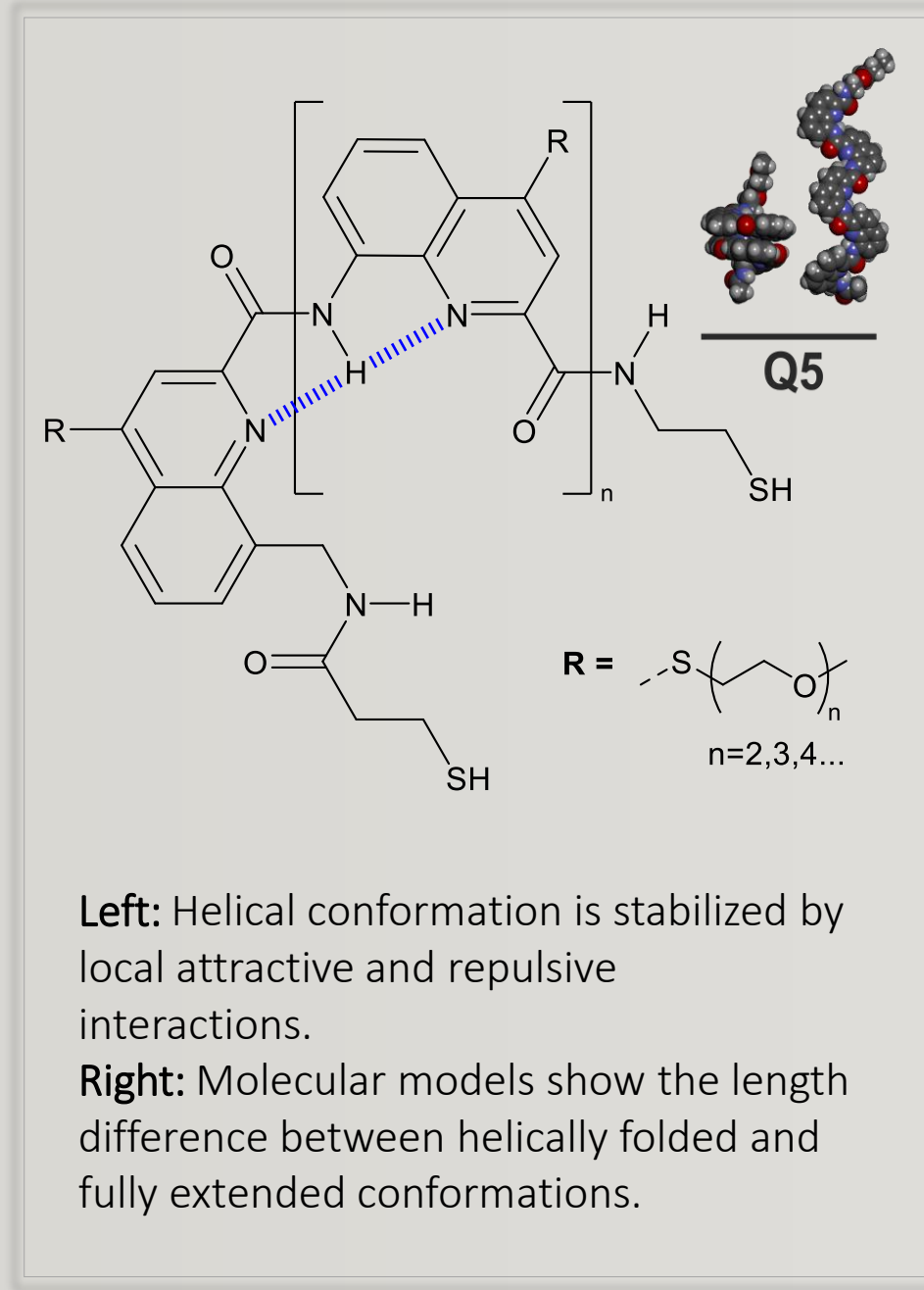
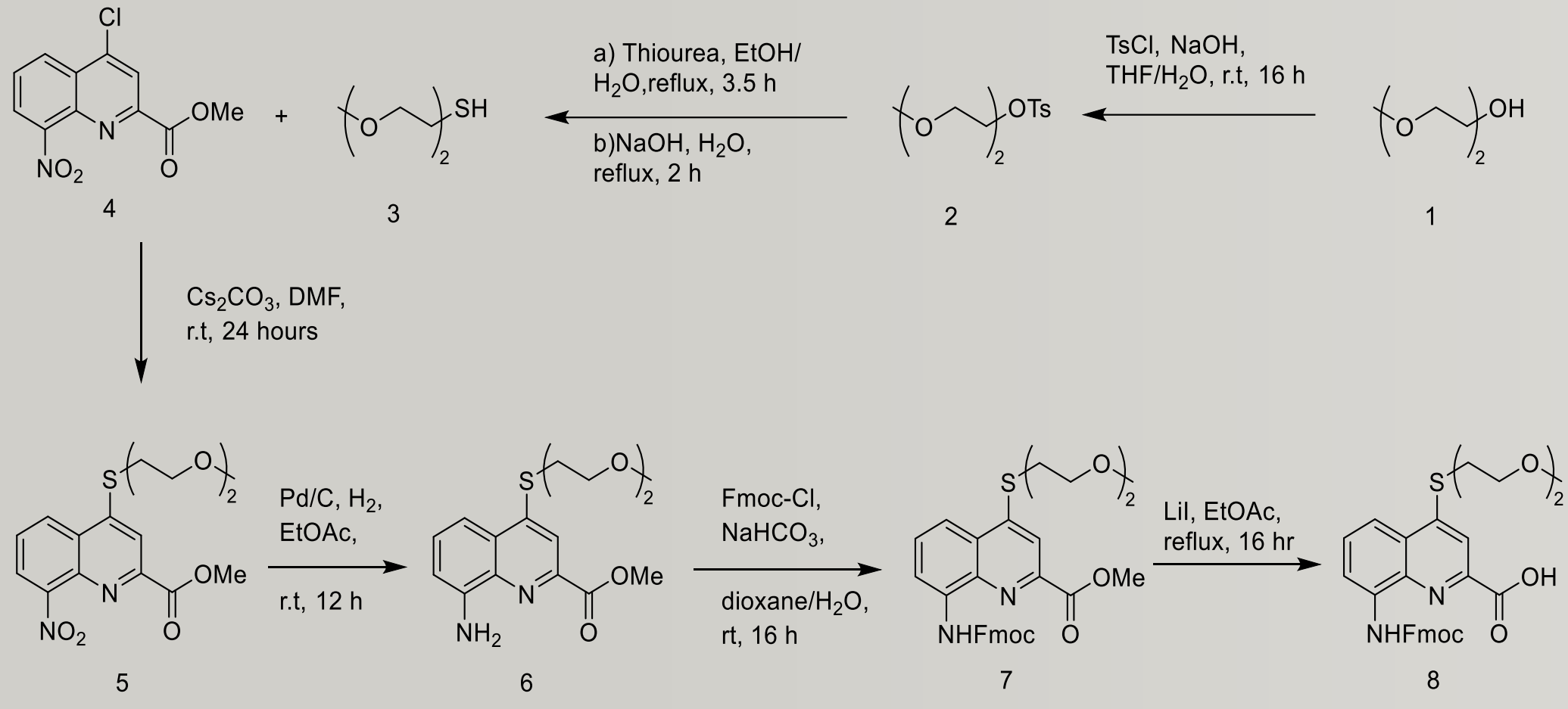
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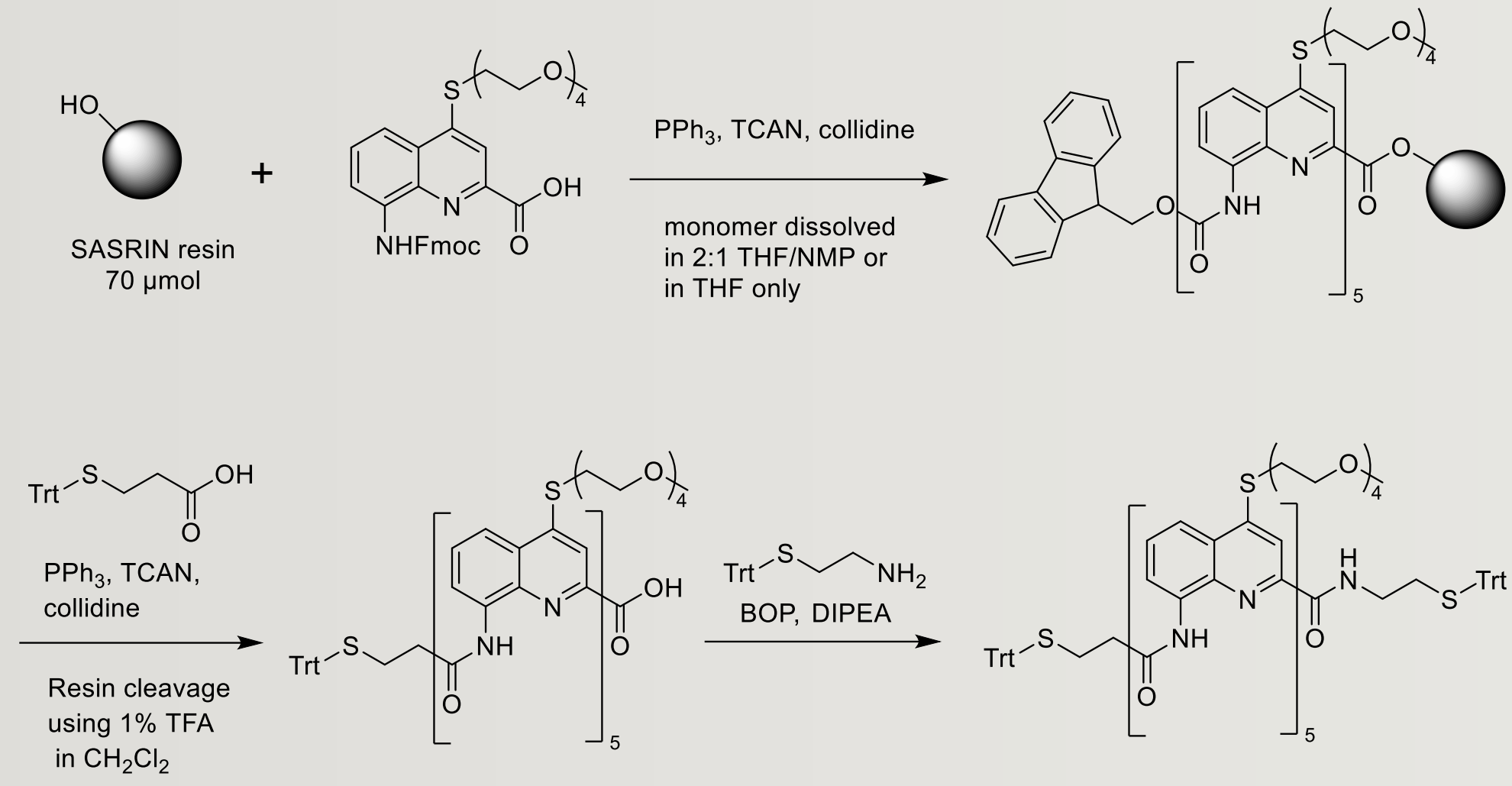
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Foldamer Synthesis

Quinoline Monomer Synthesis

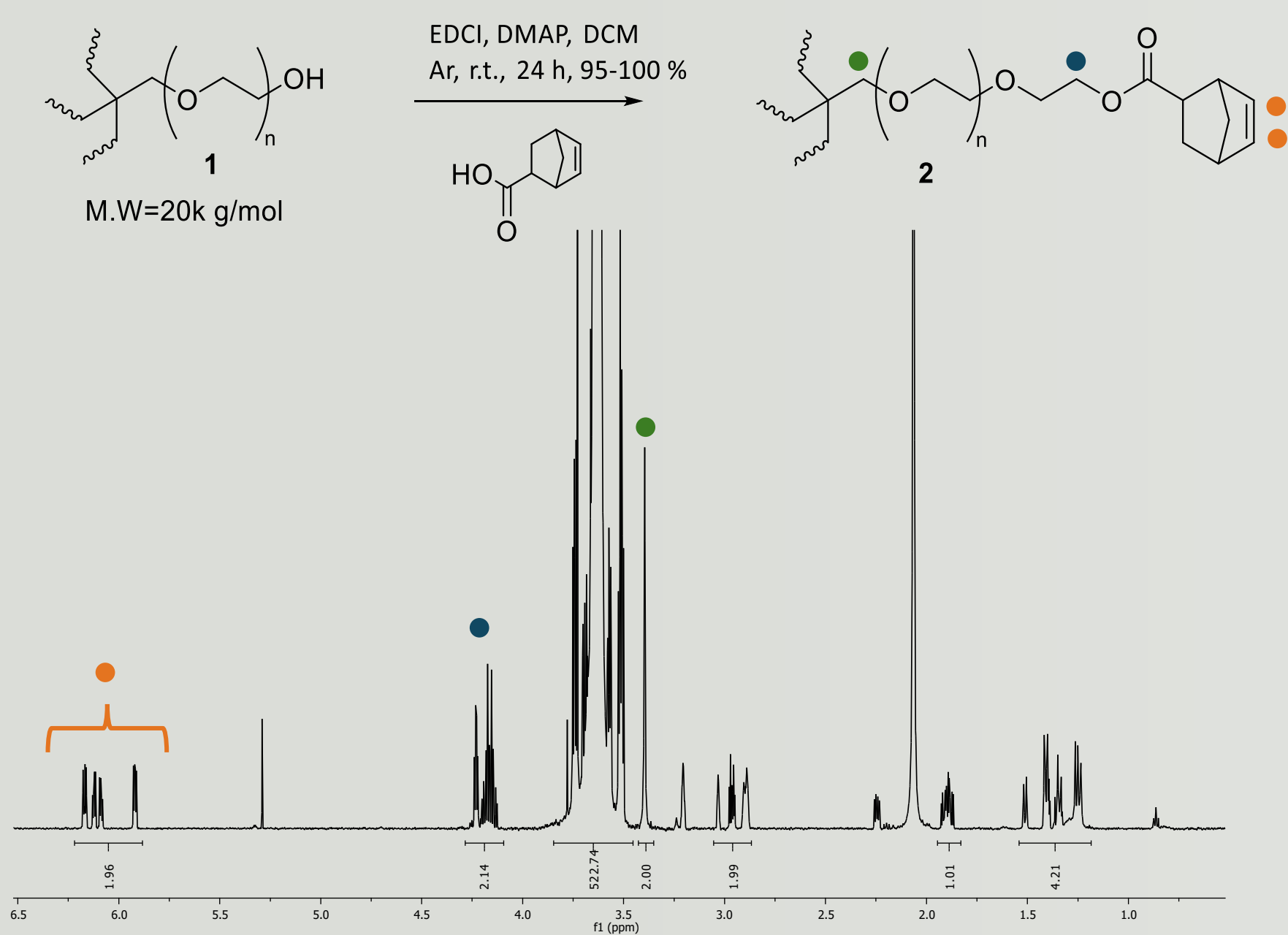


Foldamer Solid Phase Assembly

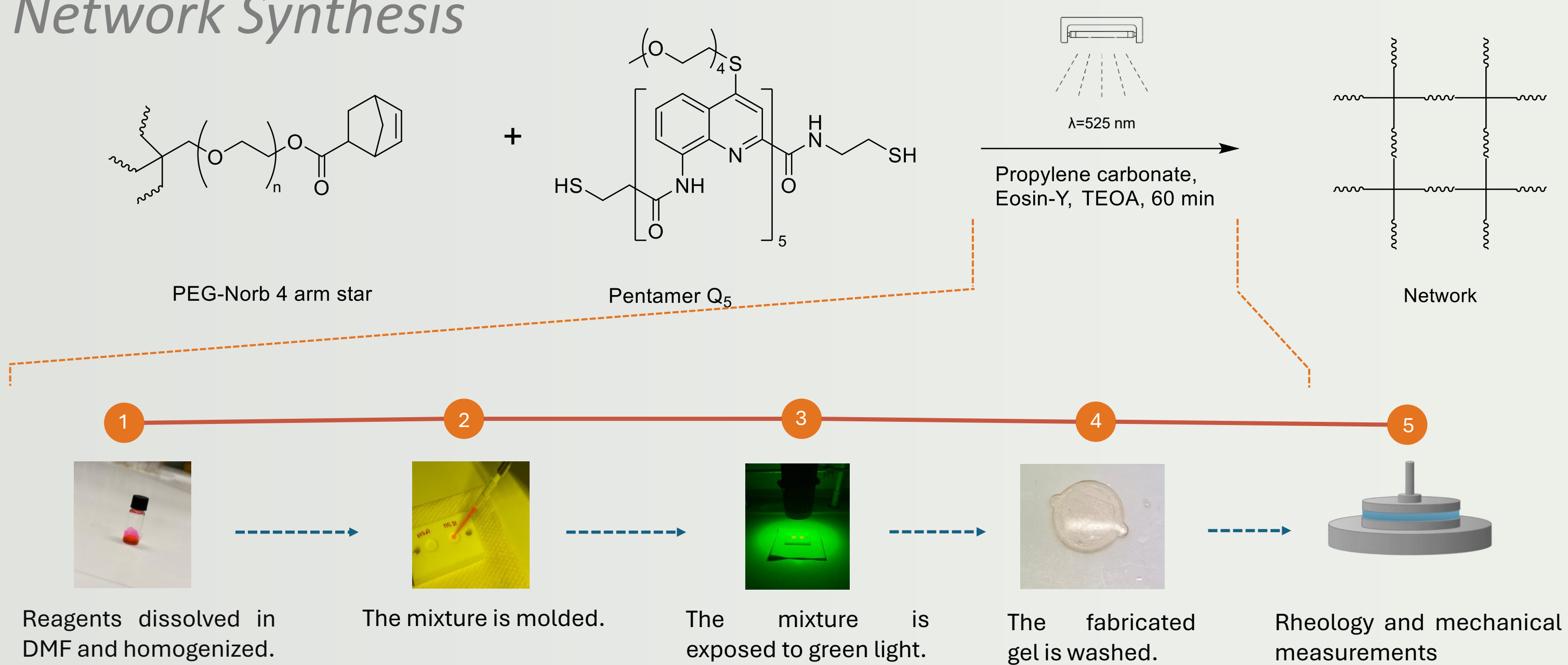


Topology 1: “Ideal” Star Network

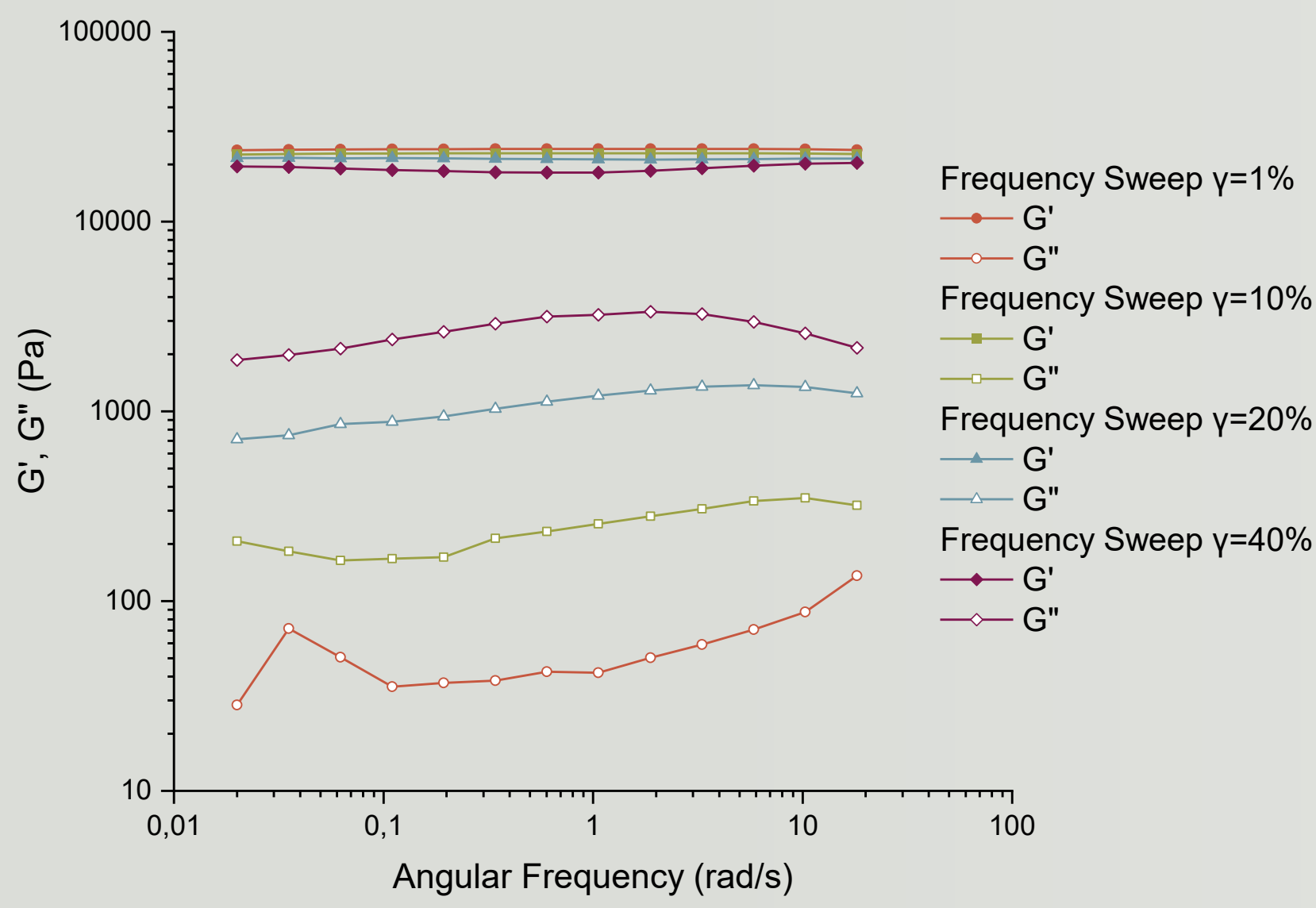
4-arm star Functionalization



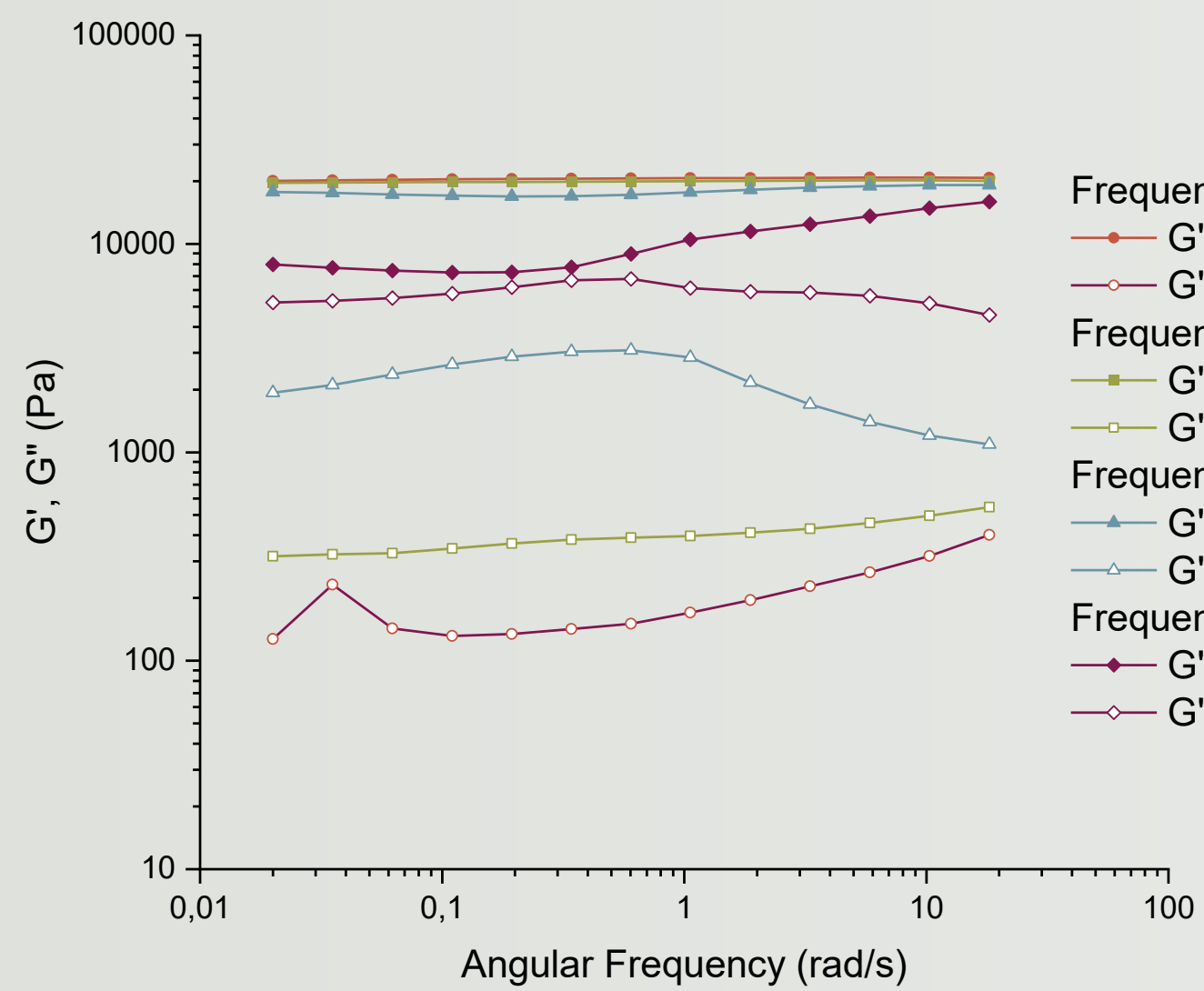
Network Synthesis



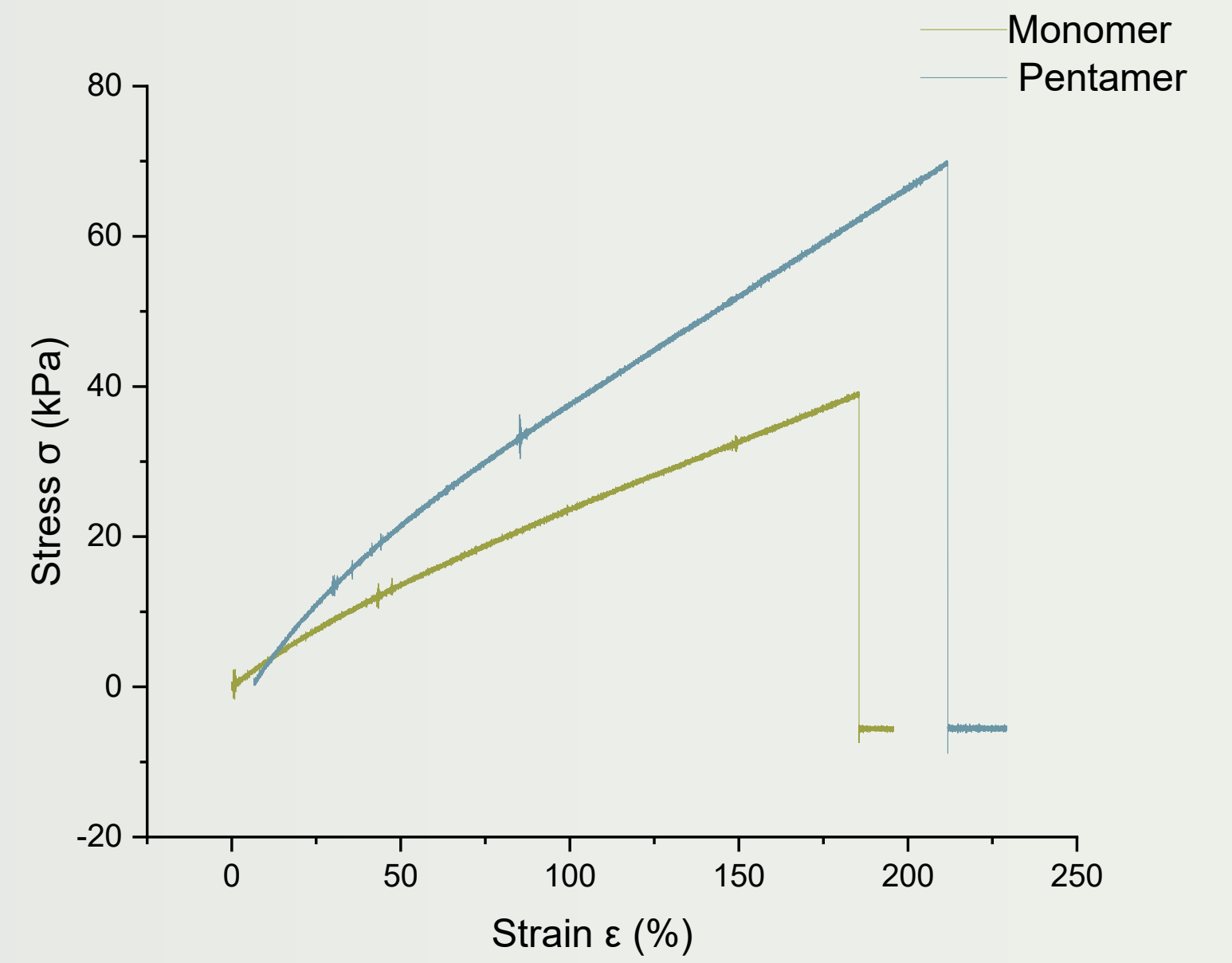
- ▶ The thiol-ene reaction used norbornene-PEG and the pentamer under 60 min irradiation at 20% polymer concentration.
- ▶ Eosin-Y was chosen for its higher absorbance than the foldamer.



- Frequency Sweeps : Pentamer Q5-crosslinked gels

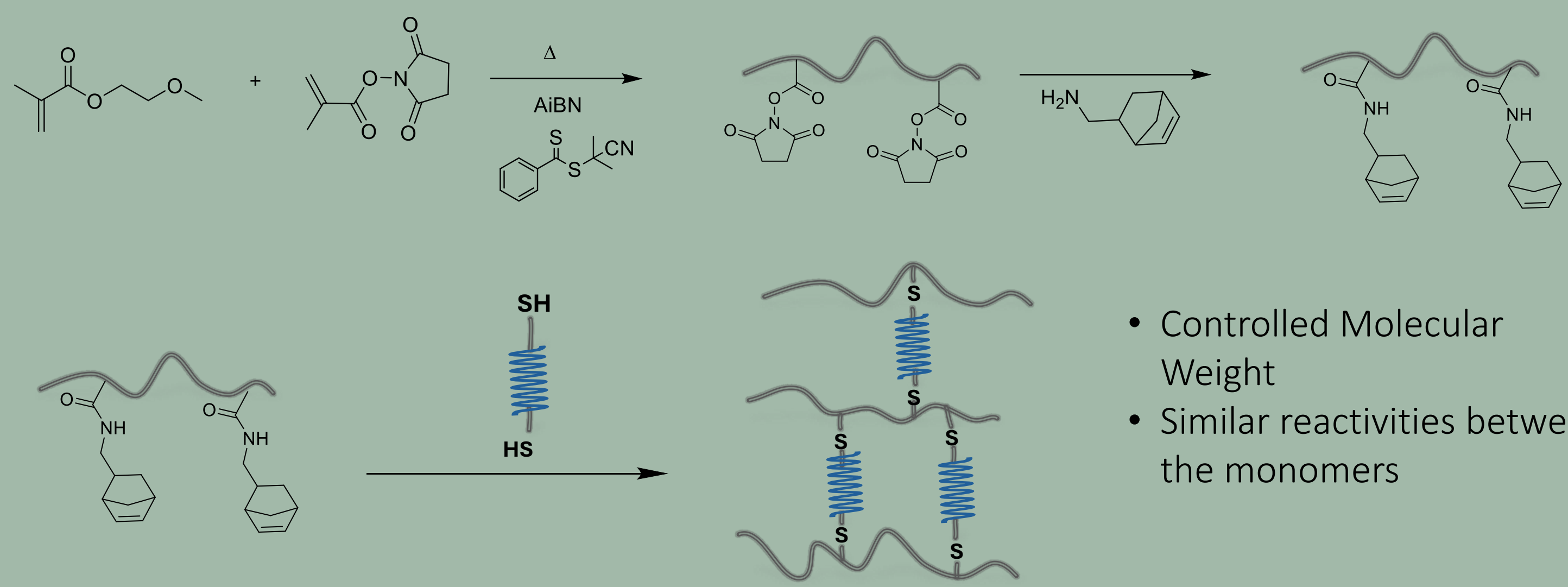
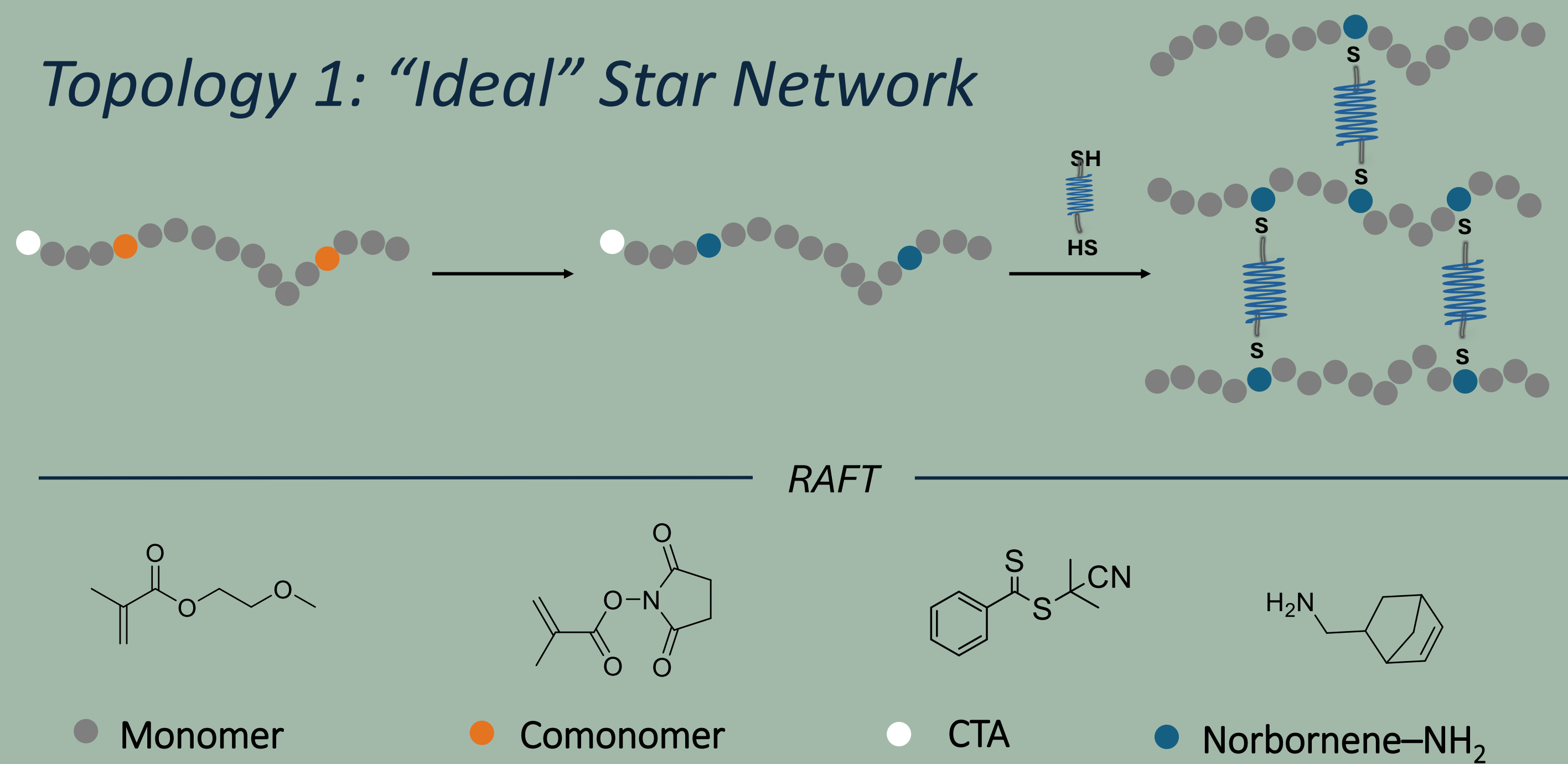


- Frequency Sweeps : Monomer Q1-crosslinked gels



- Tensile tests: Stress-Strain curve

Topology 1: “Ideal” Star Network



- Controlled Molecular Weight
- Similar reactivities between the monomers

Conclusions

- 4-arm PEG was functionalized with norbornene for thiol–ene click coupling with thiol-functionalized foldamers.
- Gels formed under 525 nm light with Eosin-Y using both monomer and pentamer foldamers, confirming efficient crosslinking.
- Gels with pentamers showed higher modulus, elasticity, and strength than those with monomers.
- Linear polymers will be crosslinked with foldamers to form a new gel architecture.

Related literature

- (1) J. Wu, P. Li, C. Dong, H. Jiang, B. Xue, X. Gao, M. Qin, W. Wang, B. Chen, Y. Cao, *Nature Commun.* **2018**, *9*, 620.
- (2) G. Guichard, I. Huc, *Chem. Commun.* **2011**, *47*, 5933.
- (3) E. Yashima, N. Ousaka, D. Taura, K. Shimomura, T. Ikai, K. Maeda, *Chem. Rev.* **2016**, *116*, 13752.
- (4) F. Devaux, X. Li, D. Sluysmans, V. Maurizot, E. Bakalis, F. Zerbetto, I. Huc, A.S. Duwez, *Chem* **2021**, *7*, 1333.

Acknowledgement

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