

Data files here contain the XY data reported in graphs in the main manuscript and ESI.

The file "Linear Rheology" contains the raw rheology data reported as viscosity (X) vs shear rate (Y) for the native trans, cis PSS and blue PSS samples.

The file "Oscillatory Rheology" contains raw rheology data reported as Storage and Loss Moduli (X) vs frequency (Y) for the native trans and blue recovered samples.

"Cycling viscosity" reports viscosity at a fixed shear rate, for varying irradiation conditions (cis or trans PSS).

The file "UV-Vis Absorption Spectroscopy" provides the absorbance (X) and wavelength (Y) for the AzoPS in the native trans, cis PSS and trans PSS.

"UV Vis_Blue" reports the wavelength and absorbance for the trans PSS, as a function of blue light irradiation.

"UV Vis_UV" reports the wavelength and absorbance for the cis PSS, as a function of UV light irradiation

The folders beginning with "SAXS" contain the relevant SAXS data referred to in the rest of the filename. Each file contains the q range (X), scattering intensity (Y) and error on scattering intensity (Y error). The model fits performed using SASview are also reported in each case as q (X) vs scattering intensity (Y).