Electronic Supplementary Material (ESI) for ChemComm.

SUPPORTING INFORMATION

In situ control of polymer helicity with a non-covalently bound photoresponsive molecular motor dopant

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Contents

General Remarks

All reagents were obtained from commercial sources and used as received without further purifcation. Solvents for reactions were reagent grade and distilled and dried according to standard procedures. ^{1}H-NMR and ^{13}C-NMR spectra were recorded on Varian AMX400 instrument. Compounds **1**[1] and **2**[2] were synthesized following procedures described in the literature. CD spectroscopy was performed on a Jasco J-715 or J-810 Spectropolarimeter in a 1 mm quartz cuvette. H_2O was distilled twice prior to use. Irradiation experiments were performed using a Spectroline model ENB-280C/FE lamp (λ_{max} = 312 nm). The doping of **1** was performed in the following way: 1 mL of a solution of **2** in Et_2O (0.1 mg/mL) was layered on top of a 1 mL solution of **1** (1 mg/mL) in H_2O. The biphasic system was stirred overnight to allow complete evaporation of the ether layer. The resulting suspension was filtered over a syringe filter and collected a 1 mm cuvette.

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CD spectra: photoisomerization of 2

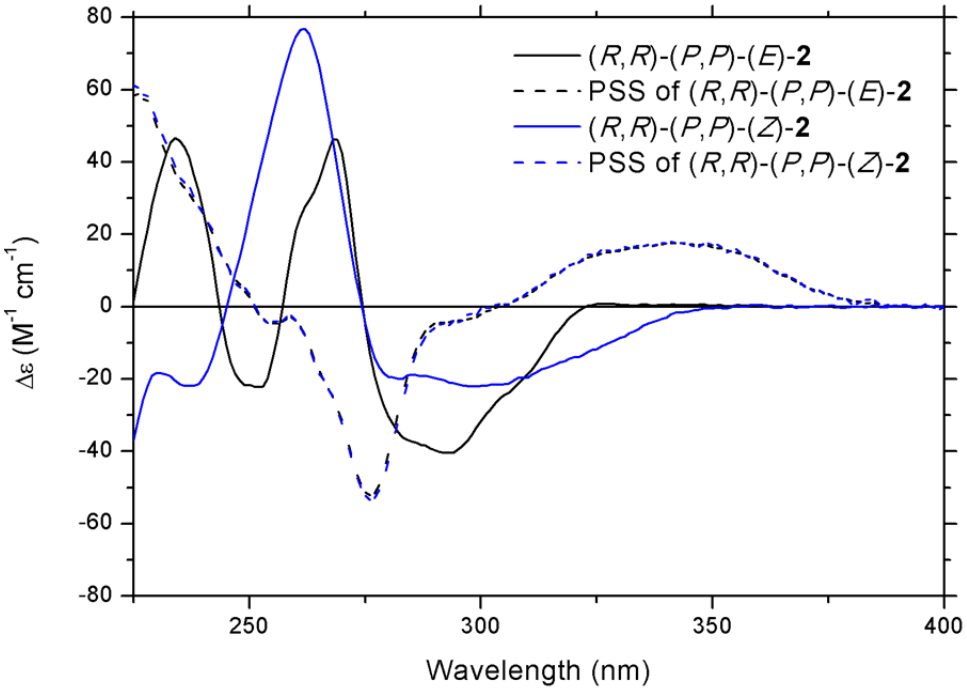

Figure S1: CD absorption spectra of solutions of **2** in Et_2O, measured in a 1cm quartz cuvette.

^{1}H-NMR spectra: photoisomerization of 2

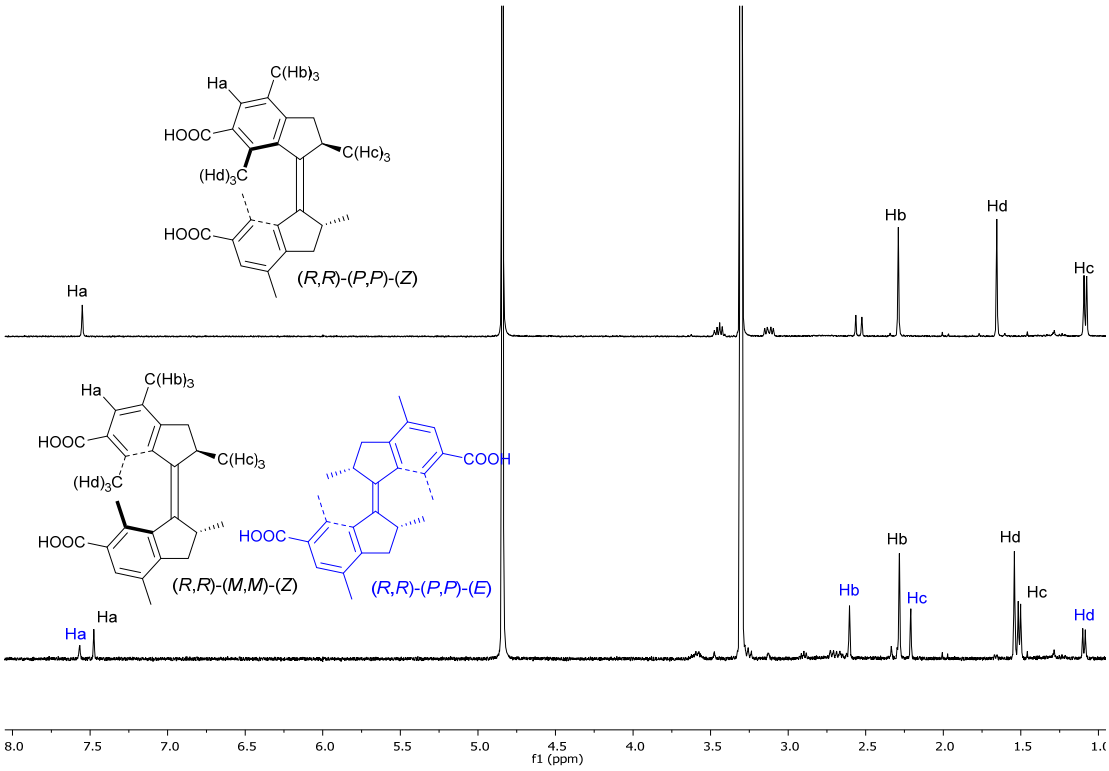

Figure S2: ^{1}H-NMR spectra (CD_3OD at 25 °C) of the photoisomerization (312 nm) of (*P*,*P*)-(*Z*)-**2** (top) into a PSS mixture (65:35) of (*M*,*M*)-(*Z*)-**2** and (*P*,*P*)-(*E*)-**2** (bottom).

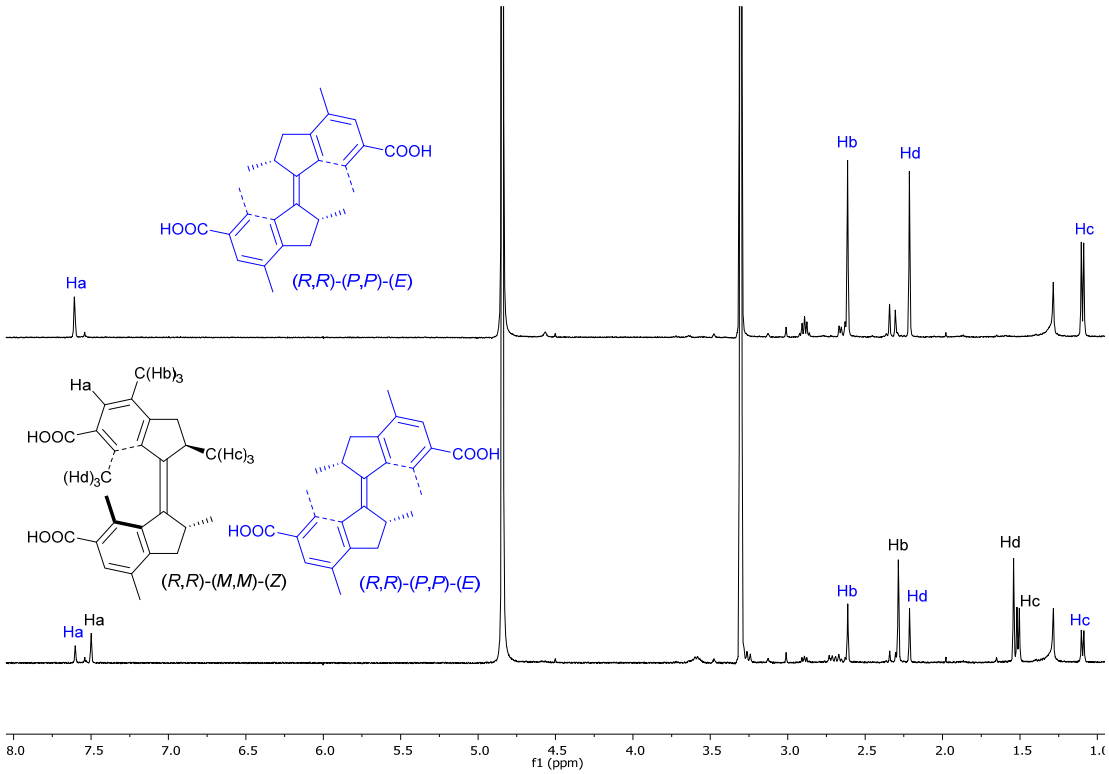

Figure S3: ^{1}H-NMR spectra (CD_3OD at 25 °C) of the photoisomerization of (*P*,*P*)-(*Z*)-**2** (top) into a PSS mixture (63:37) of (*M*,*M*)-(*Z*)-**2** and (*P*,*P*)-(*E*)-**2** (bottom).

Eyring Plot of THI of 2.

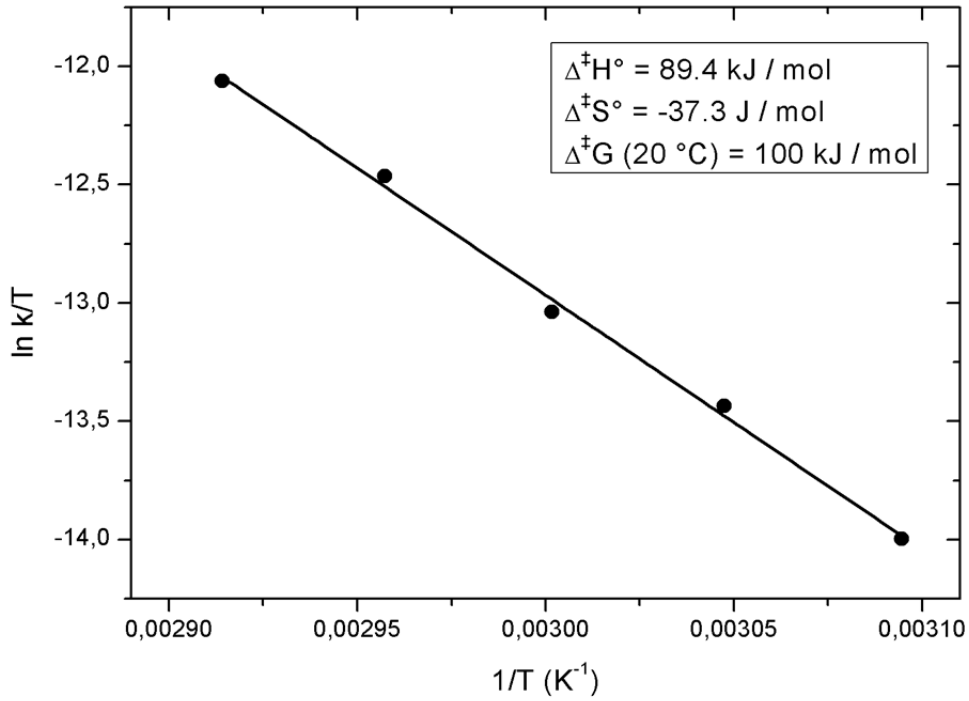

Figure S4: Eyring plot of the thermal relaxation of (*M*,*M*)-(*Z*)-**2** to (*P*,*P*)-(*Z*)-**2** in H_2O. The rate constants for this process were determined by measuring the decrease in absorbance of the (*M*,*M*)-(*Z*)-**2** band at 360 nm at five different temperatures (50 °C, 55 °C, 60 °C, 65 °C, 70 °C).

UV/Vis and CD spectra of 1

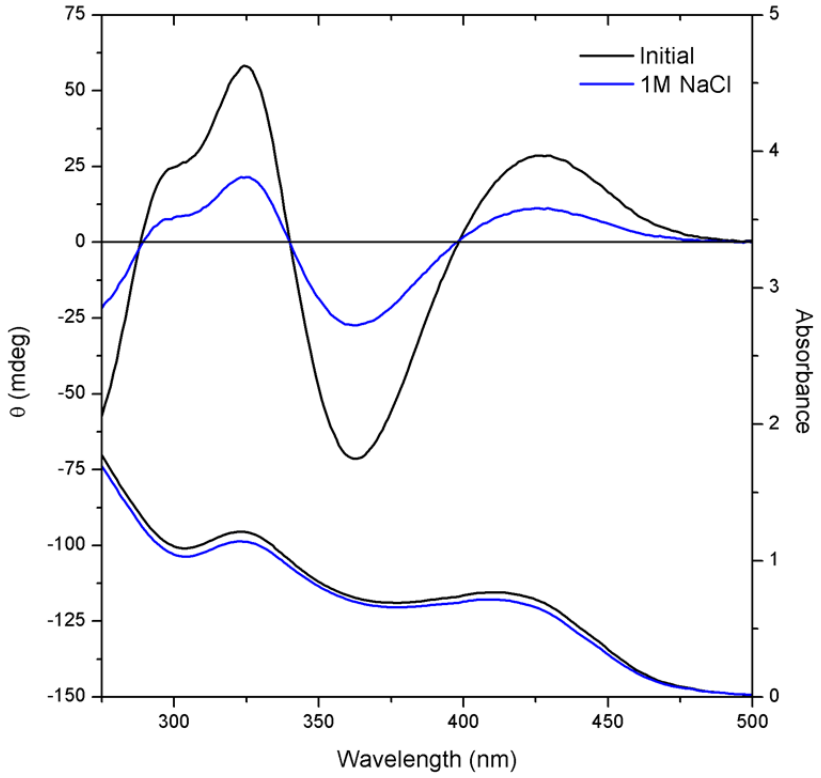

Figure S5: Effect of the addition of NaCl on the CD absorption spectrum of **1** (1.0 mg/mL) doped with (*P*,*P*)-(*Z*)-**2**.

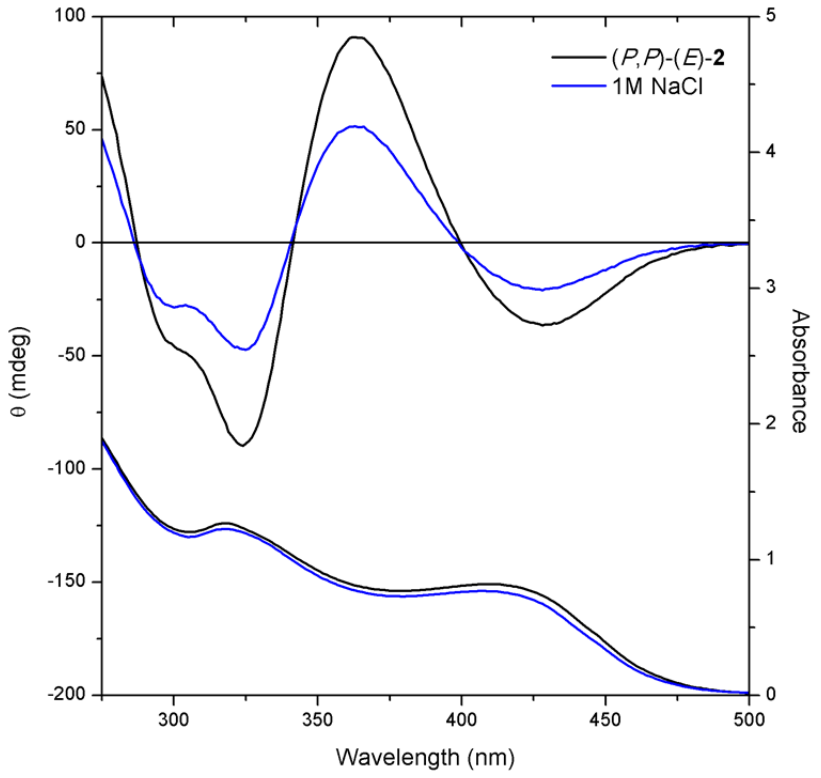

Figure S6: Effect of the addition of NaCl on the CD absorption spectrum of **1** (1.0 mg/mL) doped with (*P*,*P*)-(*E*)-**2**.

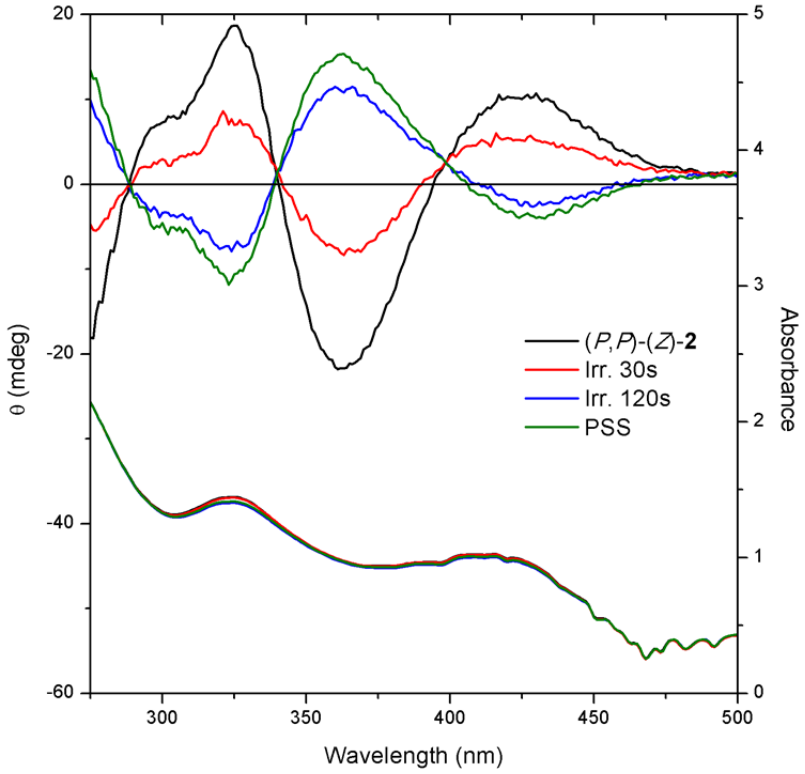

Figure S7: Changes in CD absorption spectrum of **1** (1 mg/mL in H_2O with 1M NaCl) doped with (*P*,*P*)-(*E*)-**2** upon irradiation at 312 nm. (Spectra are not baseline corrected).

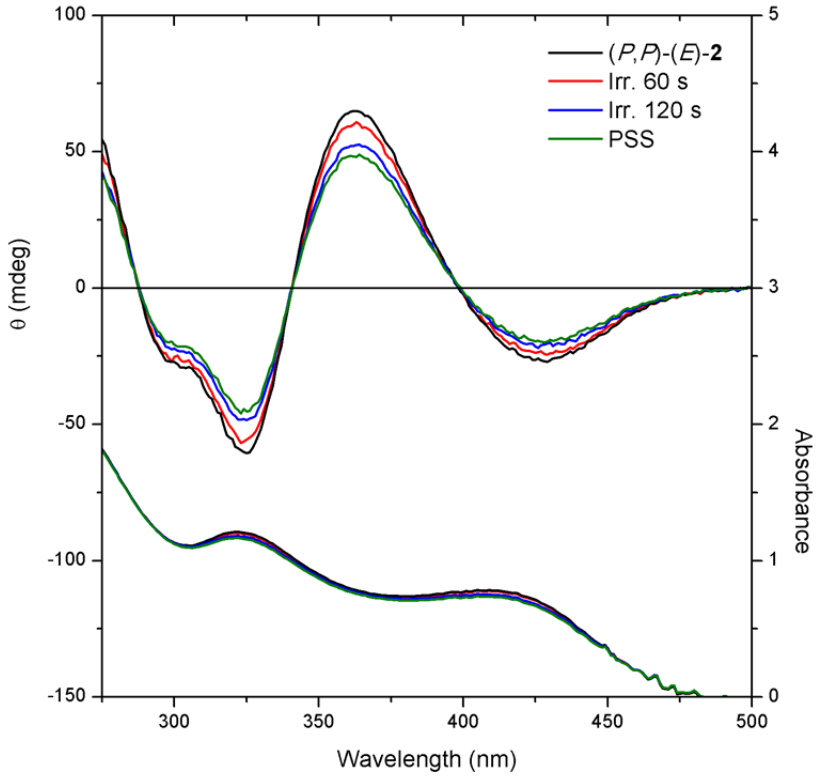

Figure S8: Changes in CD absorption spectrum of **1** (1 mg/mL in H_2O with 1M NaCl) doped with (*P*,*P*)-(*E*)-**2** upon irradiation at 312 nm.

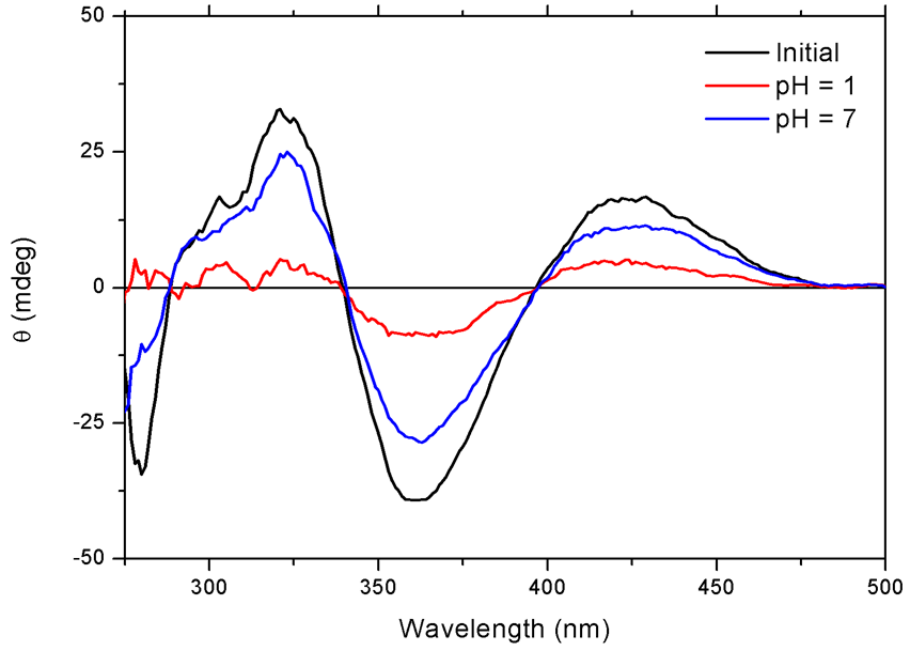

Figure S9: Changes in CD spectra of **1** (0.5 mg/mL) doped with (*P*,*P*)-(*Z*)-**2** at different pH values.

References

(1) H. Onouchi, T. Miyagawa, K. Morino and E. Yashima, *Angew. Chem. Int. Ed.*, 2006, **45**, 2381–2384.

(2) D. Zhao, T. M. Neubauer and B. L. Feringa, *Nat. Commun.*, 2015, **6**, 6652.