Electronic Supplementary Information (ESI)

Photon Magic: Chiroptical Polarisation, Depolarisation, Inversion, Retention and Switching of Non-photochromic Light-emitting Polymer in Optofluid

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Table S1. Power intensity of *left*- and *right*-circularly polarised light used in our experiments. For comparison, we showed power intensities of unpolarised light used in a previous paper.[10n]

Wavelength [nm]	*left*-CPL [μW cm^{-2}]	*right*-CPL [μW cm^{-2}]	ref) unpolarised light [μW cm^{-2}]
313	18	18	29
365	37	39	40
405	21	21	20
436	34	36	43
546	85	73	74
577	104	104	107

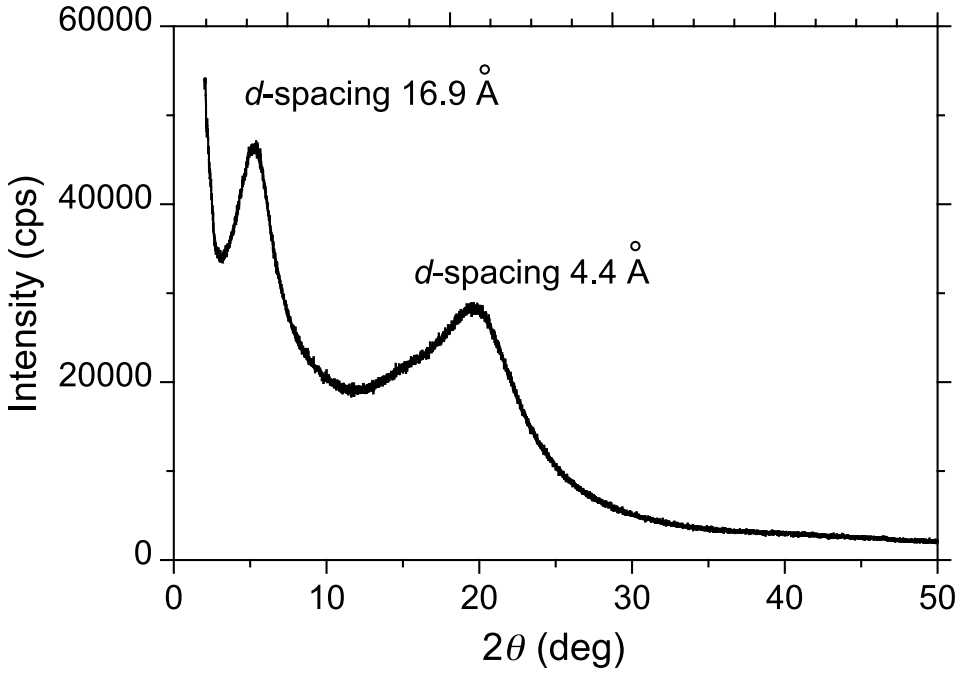
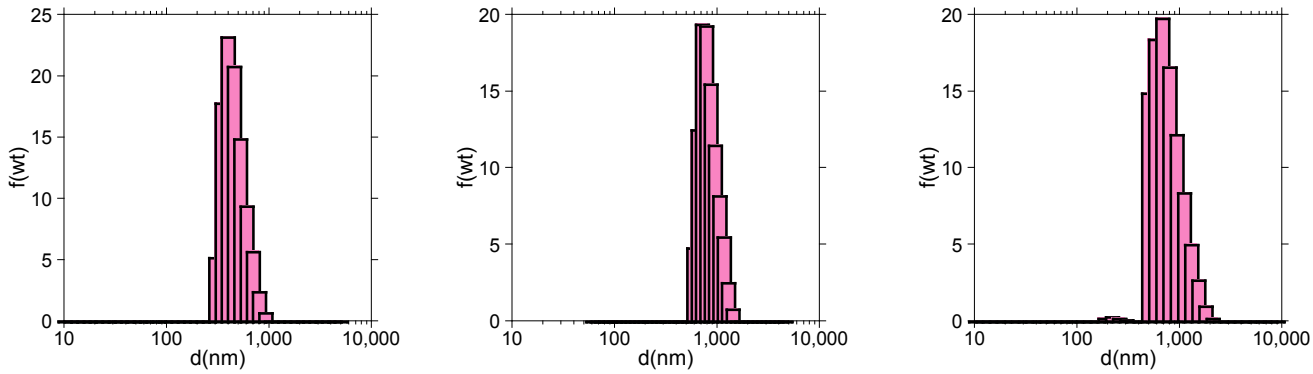


Fig. S1. WAXS of ***h*-PF8T2** powder.

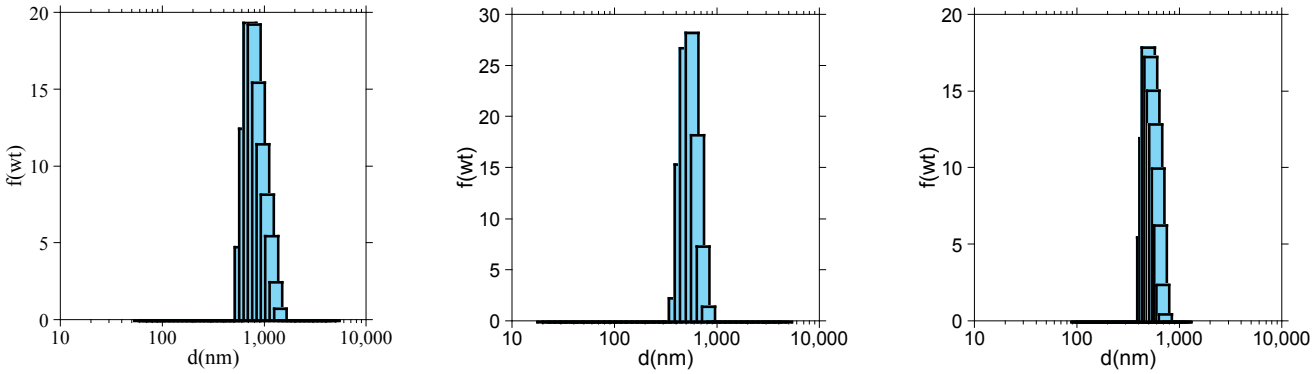
Table. S2. Changes in particle size (unit in nm) distribution of ***h*-PF8T2** particles in $CHCl_3$/MeOH (2.1/0.9 (v/v) before and after *r*-CP-photon irradiation at 546-nm for 60 min.

particle size (in nm)	t = 0 (min)	t = 30 (min)	t = 60 (min)	t = 120 (min)
Before irradiation	514	911	843	
After irradiation		545	561	580



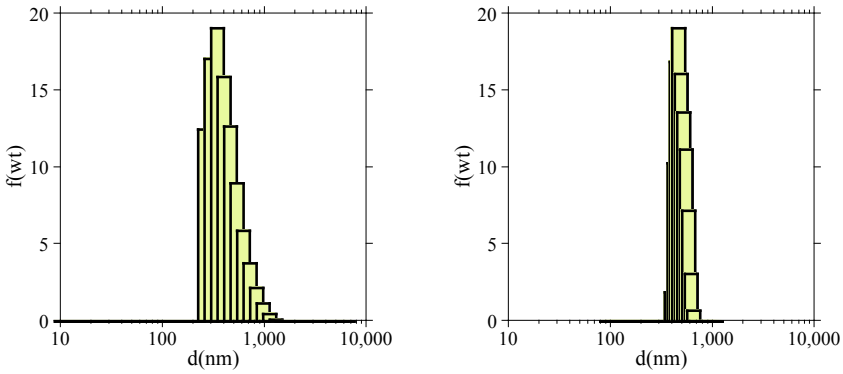
Time = 0 min *Time* = 30 min *Time* = 60 min

Fig. S2(a). Changes in particle size distribution of ***h*-PF8T2** particles in $CHCl_3$/MeOH (2.1/0.9 (v/v)) in the dark before *r*-CP-photon irradiation at 546 nm.



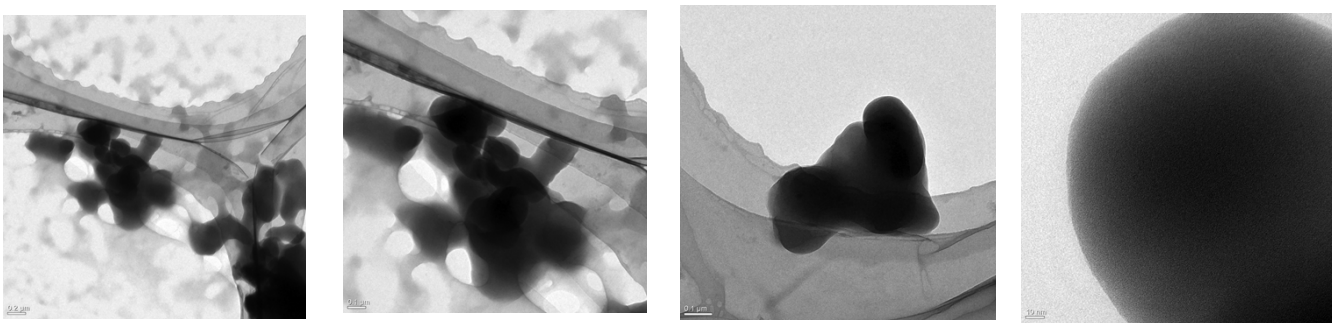
Time = 30 min *Time* = 60 min *Time* = 120 min

Fig. S2(b). Changes in particle size distribution of ***h*-PF8T2** particles in $CHCl_3$/MeOH (2.1/0.9 (v/v)) during *r*-CP-photon irradiation at 546-nm for 60 min.



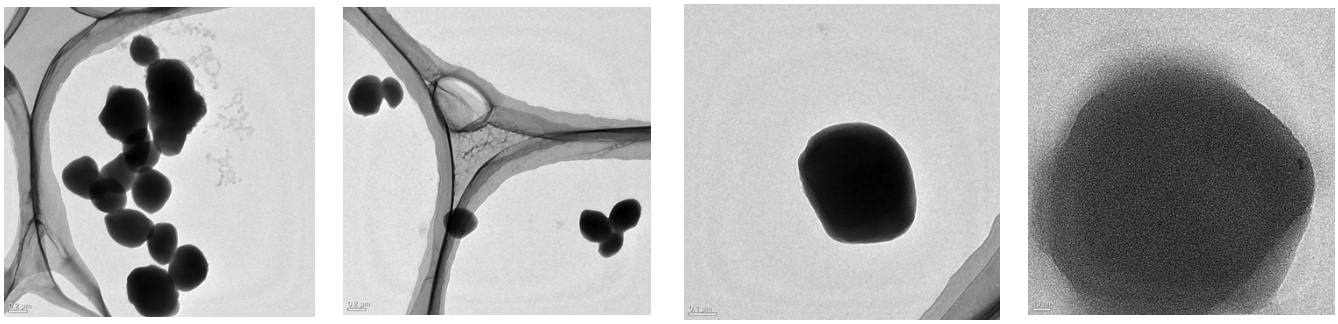
Time = 30 min *Time* = 60 min

Fig. S2(c). Changes in particle size distribution of ***h*-PF8T2** particles in $CHCl_3$/MeOH (2.1/0.9 (v/v) after *r*-CP-photon irradiation at 546-nm for 60 min.



Scale bar: 200 nm Scale bar: 100 nm Scale bar: 100 nm Scale bar: 10 nm

Fig. S3(a). HRTEM images of ***h*-PF8T2** particles before irradiating *r*-CP-photon.



Scale bar: 200 nm Scale bar: 200 nm Scale bar: 100 nm Scale bar: 10 nm

Fig. S3(b). HRTEM images of ***h*-PF8T2** particles after *r*-CP-photon at 546 nm for 60 min.

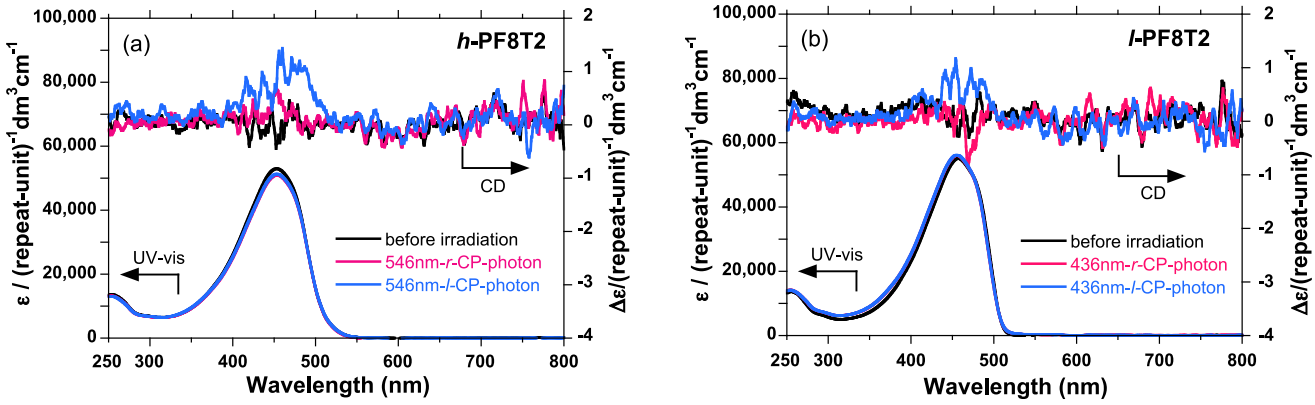


Fig. S4. CD and UV-visible spectra of (a) ***h*-PF8T2** and (b) ***l*-PF8T2** dissolved in $CHCl_3$ by *r*- and *l*-CP-photon irradiation for 60 min and, for comparison, those in $CHCl_3$ before CP-photon irradiation. Excitation wavelengths are 546-nm for ***h*-PF8T2** and 436-nm ***l*-PF8T2**, respectively. Black solid lines in CD and UV-visible spectra before *r*- and *l*-CP-photon irradiation are given.

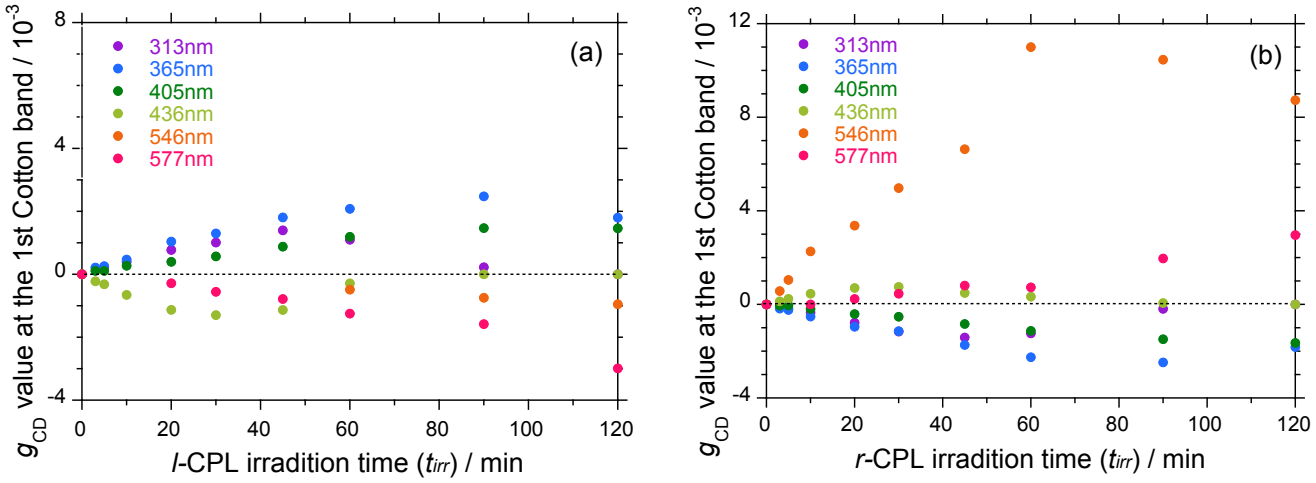


Fig. S5. The changes in g_{CD} values of ***h*-PF8T2** particles in $CHCl_3$/MeOH (2.1/0.9 (v/v)) as a function of irradiation time of (a) *l*-CP-photons and (b) *r*-CP-photons at six wavelengths.

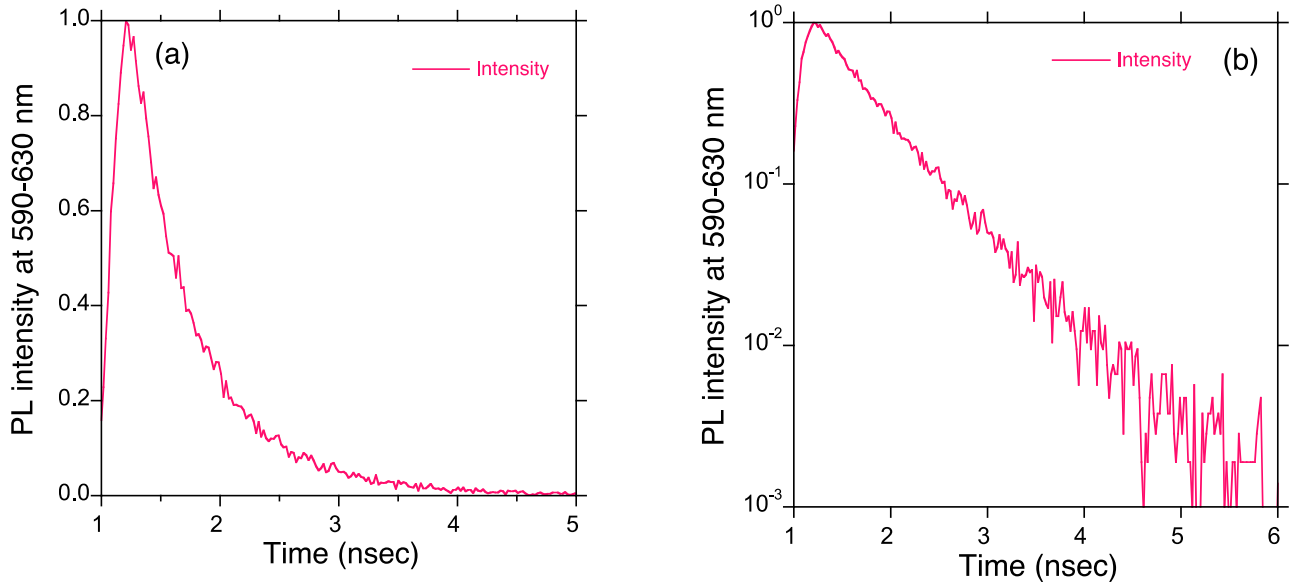
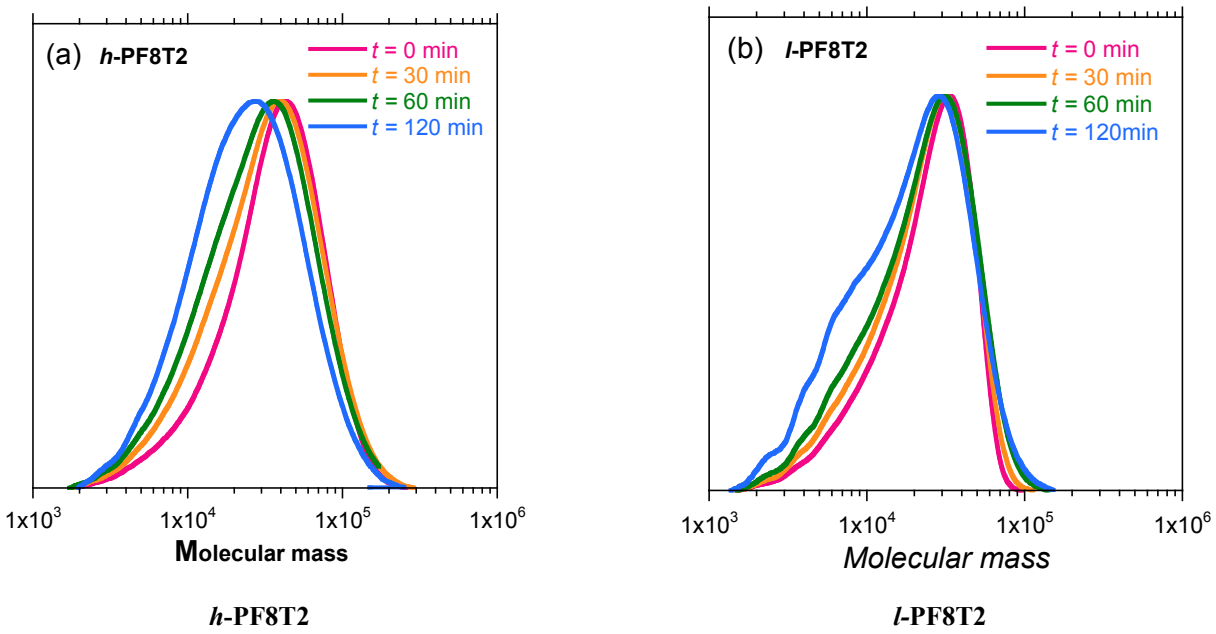


Fig. S6. Photodynamics monitored at 590-630 nm of ***h*-PF8T2** aggregates in $CHCl_3$/MeOH (2.1/0.9 (v/v)) generated by *r*-CP-photon irradiation at 546-nm. (a) linear-linear plot and (b) log-linear plot. We obtained that τ_1 = 0.487 nsec (0.917) and τ_2 = 0.811 nsec (0.083). The time-resolved photoluminescence lifetime was measured on a streak camera using a femtosecond laser pulse from an optical parametric amplifier (Hamamatsu Photonics C4780). The centre wavelength of 400 nm was used as the excitation light source (Coherent Mira, Ushio KEC-160).



***h*-PF8T2** ***l*-PF8T2**

Fig. S7. Changes in GPC curves of (a) ***h*-PF8T2** particles in $CHCl_3$/MeOH (2.1/0.9 (v/v) during *r*-CP-photon irradiation at 546-nm and (b) ***l*-PF8T2** particles in $CHCl_3$/MeOH (1.8/1.2) during *r*-CP-photon irradiation at 436-nm.

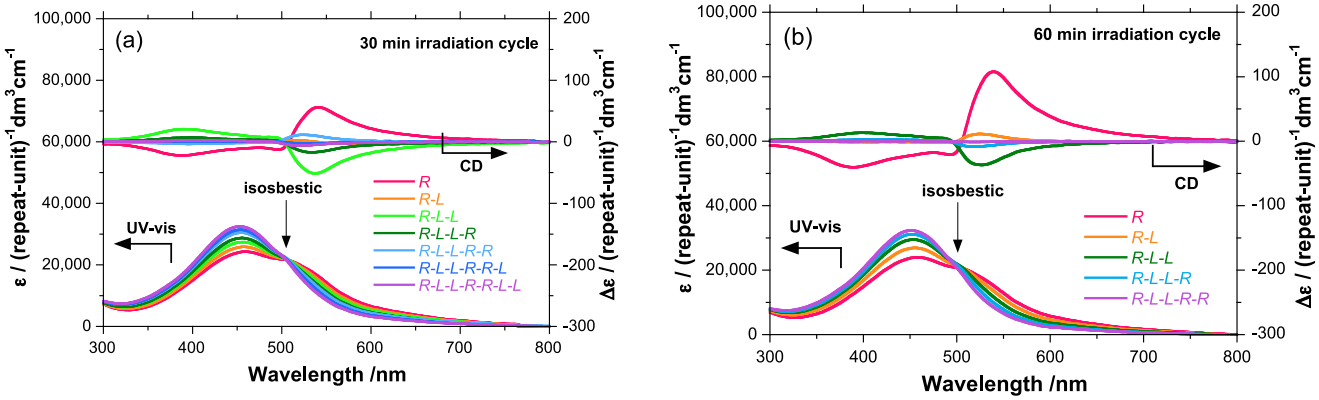


Fig. S8. The change in CD and UV-visible spectra of ***h*-PF8T2** particles in $CHCl_3$/MeOH (2.1/0.9 (v/v)) by alternating *r*- and *l*-CP-photon at 2.27 eV (546 nm) with (a) 30-min interval and with (b) 60-min interval.

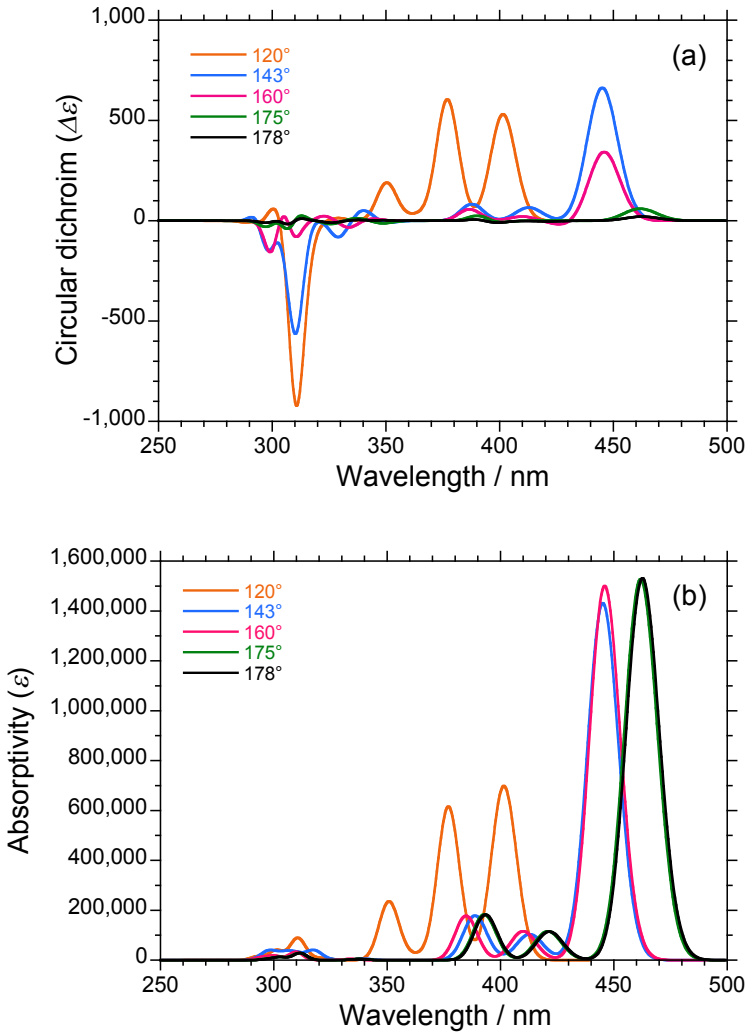


Fig. S9. Simulated CD spectra (a) and simulated UV-vis spectra (b) (a full-width-at-half-maximum (*fwhm*) = 0.05 eV, twenty transition states) of helical ***oligo*-F1T2** with dihedral angles of 120°, 143°, 160°, 175° and 178° obtained with ZINDO.