Electronic Supplementary Information (ESI) for:

Limonene Magic: Noncovalent Molecular Homochirality Transfer Leading to Ambidextrous Circularly Polarised Luminescent Polymers

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CD–silent polymers (limonene chirality transfer disable)

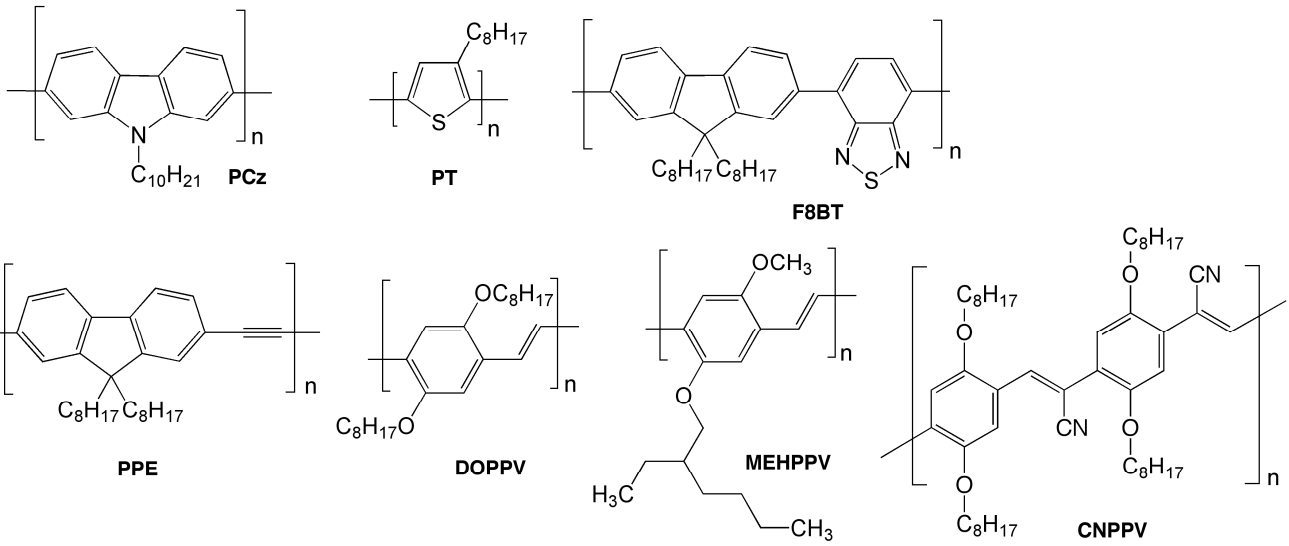


Chart S1 Chemical structures of other CD-silent π-conjugated polymers studied in this work.

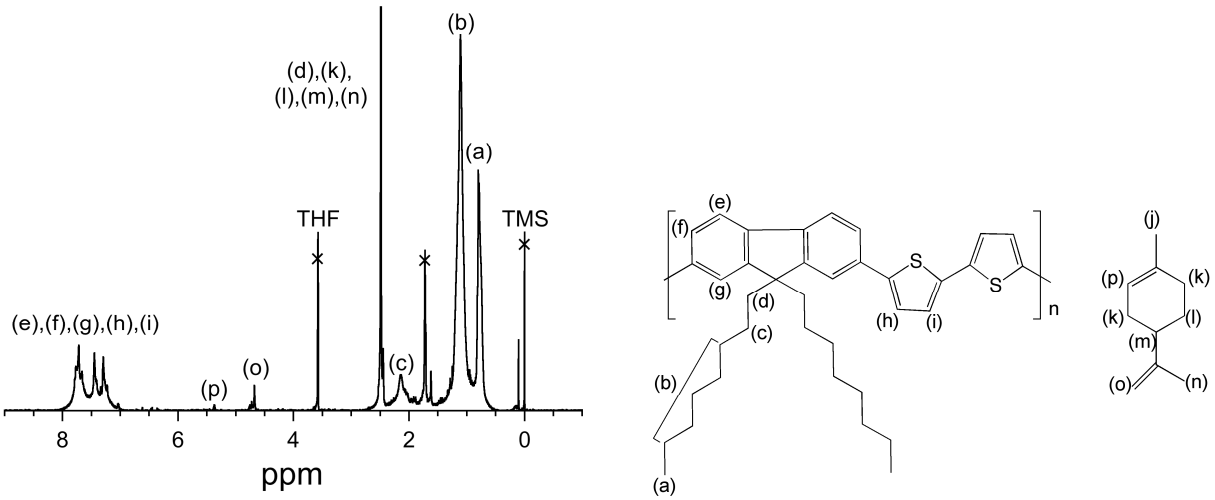
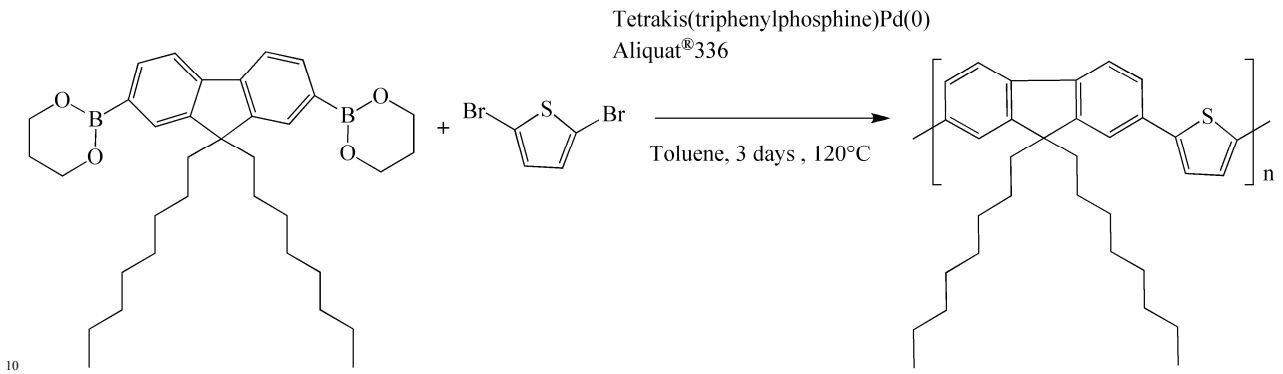


Fig. S1 ^{1}H NMR of **F8T2** solid produced with **1*R*** and re-dissolved in THF-d_8.

Synthesis of F8T1. To a flask containing dioctylfluorene-2,7-diboronic acid (0.854 g, 1.53 mmol) and tetrakis(triphenylphosphine)palladium(0) (0.18 g, 0.015 mmol) under pure nitrogen atmosphere, 10 mL of toluene solution containing dibromothiophene (0.17 ml 1.53 mmol) and Aliquat®336 (0.07 ml, 0.15 mmol) was added. When the mixture was elevated at 120°C, 3.6 mL of aqueous sodium bicarbonate (2M) was added and allowed to react for three days. An excess amount of bromobenzene (0.16 mL, 1.5 mmol) was add to quite the reaction. Toluene (2mL) was added to complete the reaction. After reacted for 12 hours, the reaction mixture was poured to methanol. The crude precipitate was collected by a reduced filtration. This purification process with methanol was repeated twice. Yield, 0.84 g (82 %).



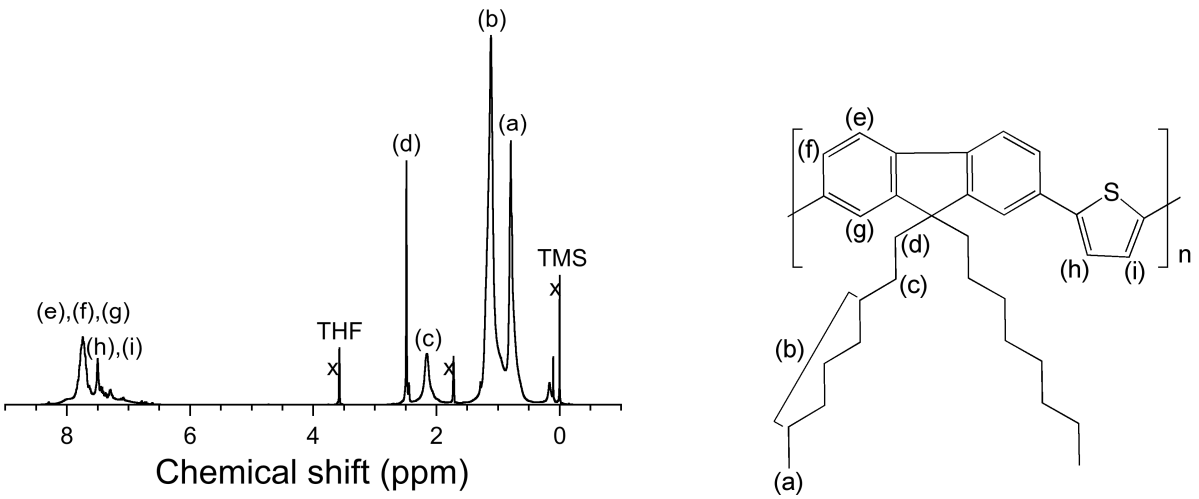


Fig. S2 ^{1}H NMR of **F8T1** in THF-d_8.

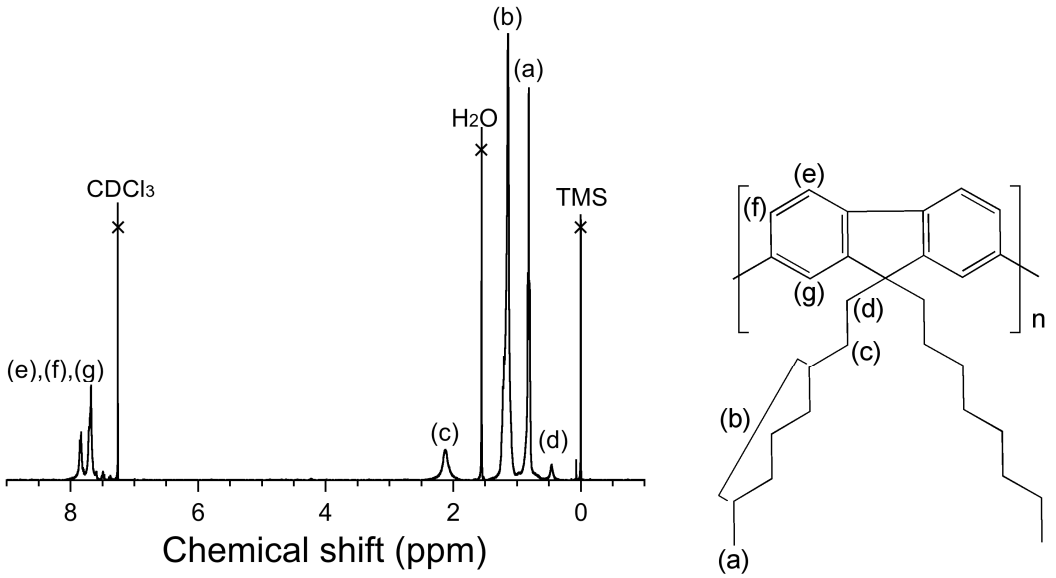


Fig. S3 ^{1}H NMR of **F8** in chloroform-*d*.

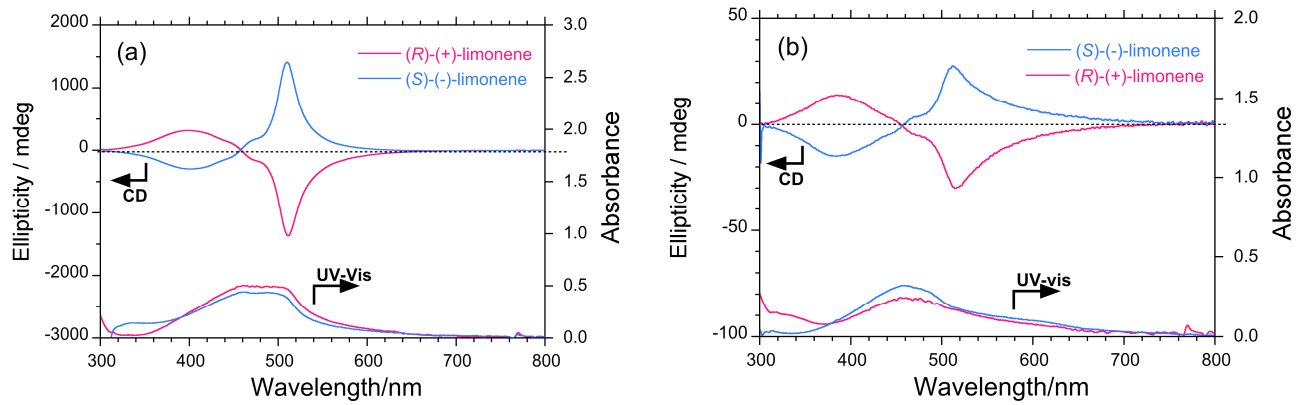


Fig. S4 A comparison between CD and UV-vis spectra of **F8T2** particles formed by (a) the normal addition mode and (b) the reverse addition mode.

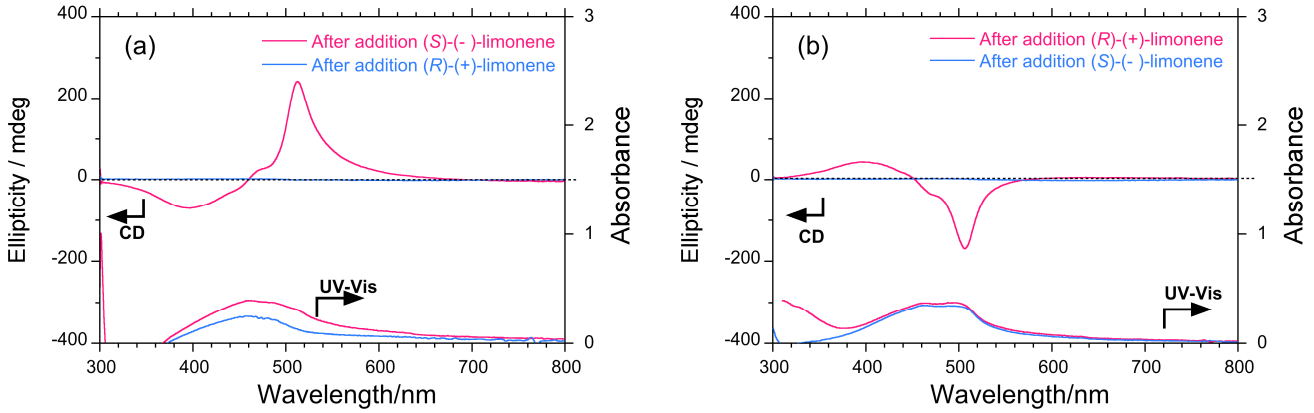


Fig. S5 CD and UV-vis spectra of **F8T2** in **1*R***/**1*S***/chloroform/methanol (1.0/1.0/0.3/0.7 (v/v/v/v)). The addition effect of the opposite limonene to the optically active **F8T2** particles produced in chloroform/**1*R*** and **1*S***/methanol. (a) 1mL of **1*S*** or 1mL of **1*R*** to 1mL **1*S*** induced **F8T2** particles. (b) 1mL of **1*S*** or 1mL of **1*R*** to 1 mL **1*R*** induced **F8T2** particles.

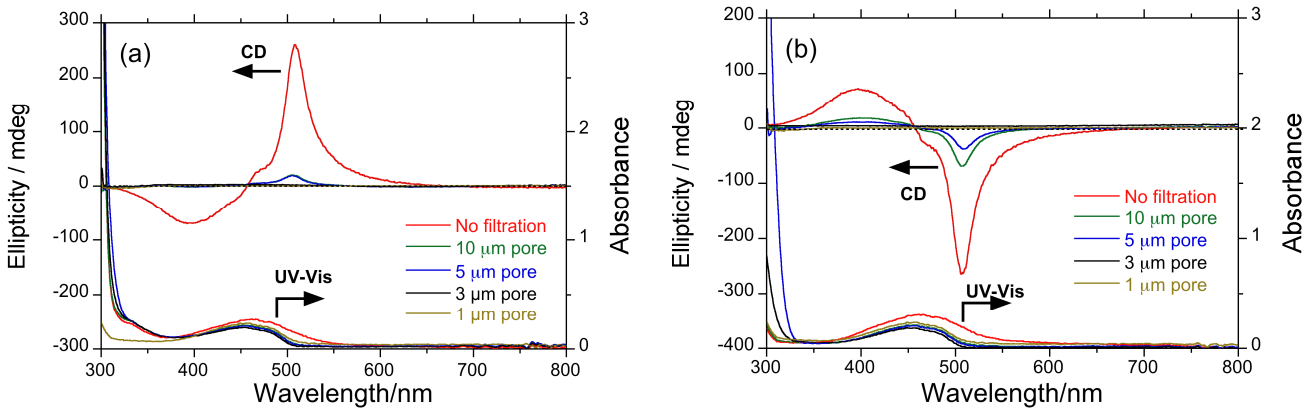


Fig. S6 Changes in CD/UV-vis spectra of **F8T2** particles produced in limonene/chloroform/methanol [2.0/0.3/0.7 (v/v/v)] at 25°C with stirring at 800 rpm (CW), as a function of membrane filter pore size using (a) **1*R*** and (b) **1*S***.

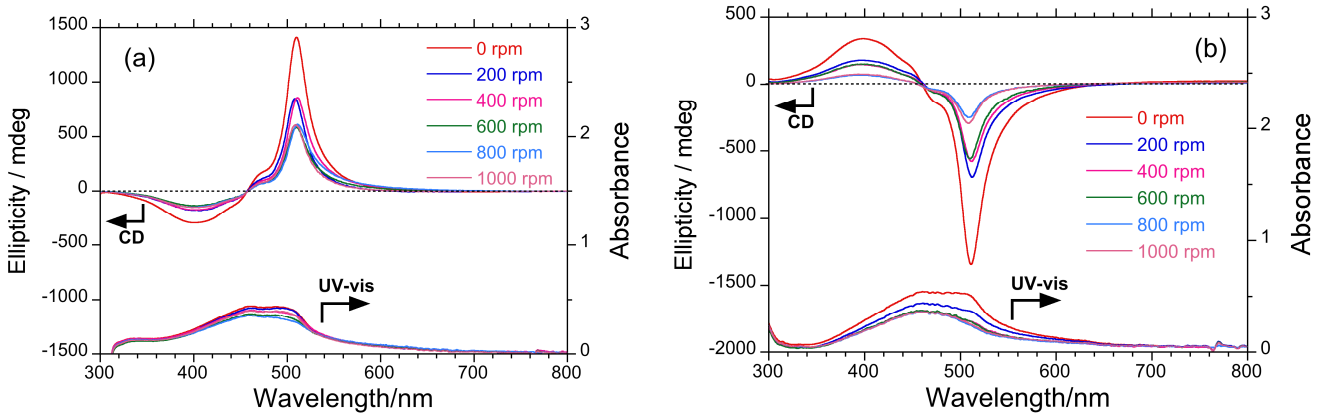


Fig. S7 Changes in CD and UV-vis spectra of **F8T2** in limonene/chloroform/methanol [2.0/0.3/1.7 (v/v/v)] as a function of stir speed with 800 rpm in CW operation. (a) **1*S*** and (b) **1*R***.

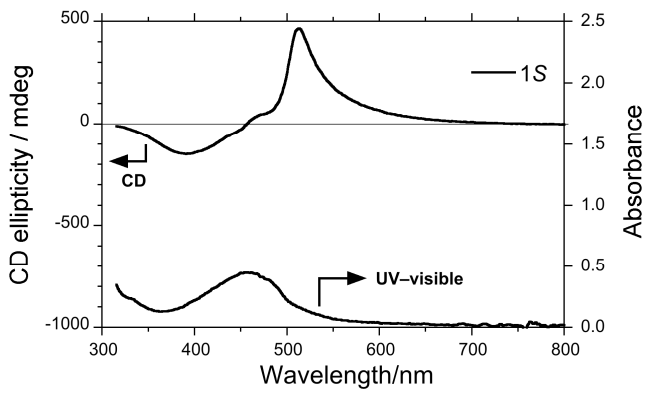


Fig. S8 CD and UV-vis spectra of **F8T2** produced in **1*S***/chloroform/methanol [2.0/0.3/0.7 (v/v/v)] at 25°C with 800 rpm in CW operation. Herein we re-used **1*S***, which was purified by distilling in reduced pressure (bp 94°C/68 Torr) of approximately 200 g of impure **1*S***, containing chloroform, methanol and **F8T2**, that was used and stored in the limonene chirality transfer experiments. The recovery ratio of **1*S*** was 97% after the distillation.

Table S1. Chiroptical data of **F8T2**, **F8T1** and **F8** polymer particles obtained by the solvent chirality transfer.

polymer	chiral solvent [a)]	good solvent [a)]	poor solvent [a)]	g_{CD}	g_{CPL}
F8T2	**1*R***	chloroform	methanol	-8.6×10^{-2} /511 nm	-6.3×10^{-2} /513 nm
			ethanol	$+1.1\times10^{-3}$	–
			isopropanol	-3.2×10^{-5}	–
		THF	methanol	-1.9×10^{-2}	–
	1*S*	chloroform	methanol	$+1.1\times10^{-1}$ /508 nm	$+7.0\times10^{-2}$ /517 nm
			ethanol	-1.3×10^{-3}	–
			isopropanol	$+1.2\times10^{-5}$	–
		THF	methanol	$+1.3\times10^{-2}$	–
	(**1***R*)-(+)-α-pinene	chloroform	methanol	-4.4×10^{-4}	–
	(**1***S*)-(–)-α-pinene	chloroform	methanol	$+5.1\times10^{-4}$	–
	(*R*)-(–)-carvone	chloroform	methanol	not detected	–
	(*S*)-(+)-carvone	chloroform	methanol	not detected	–
	(*l*)-(–)-menthol	chloroform	methanol	-2.4×10^{-3}	–
	(*S*)-(–)-2-methylbutanol	chloroform	methanol	not detected	–
F8T1	**1*R***	chloroform	methanol	-1.8×10^{-4}/470nm	–
	1*S*			1.3×10^{-4}/470nm	–
F8	**1*R***	chloroform	methanol	-5.4×10^{-4}/434 nm -2.4×10^{-4}/404 nm 5.6×10^{-5}/361 nm	-3.0×10^{-3}/433 nm
	1*S*	chloroform	methanol	-3.2×10^{-4}/434 nm -2.9×10^{-4}/404 nm 5.26×10^{-5}/361 nm	$+2.8\times10^{-3}$/438 nm

a) For **F8T2** ($M_w = 2.3\times10^4$, $PDI = 2.5$), limonene/chloroform/methanol = 2.0/0.3/0.7 (v/v/v). For **F8T1** ($M_w = 4.9\times10^4$, $PDI = 5.15$), limonene /chloroform/methanol = 2.0/0.3/0.7 (v/v/v). For **F8** ($M_w = 7.4\times10^4$, $PDI = 4.4$), limonene/good/poor solvents = 1.2/0.3/1.5 (v/v/v). Other chiral solvent/good solvent/poor solvent = 1.9/0.3/0.8 (v/v/v).