

## Supporting Information

### **Optically active polymer particles with programmable surface microstructures constructed by chiral helical polyacetylene**

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**Table S1.** The elemental analysis data for PGMA seeds, JTPs, alkynyl-JTPs and *S*-JPs.

	N [%]	C [%]	H [%]
PGMA seeds	0.01	58.89	7.2
JTPs	0.01	58.61	7.24
Alkynyl-JTPs	4.16	57.43	7.48
<i>S</i> -JPs	4.26	59.9	7.37

The content of PolySM in *S*-JPs can be determined based on the N content.

$$\text{Content of PolySM (wt\%)} = (N_{S\text{-JPs}}\% - N_{\text{Alkynyl-JTPs}}\%)/(N_{\text{M}}\% - N_{\text{Alkynyl-JTPs}}\%) = 3 \text{ wt\%}$$

**Table S2.** The elemental analysis data for PGMA seeds, GTPs, alkynyl-GTPs and *S*-GPs.

	N [%]	C [%]	H [%]
PGMA seeds	0.01	58.89	7.2
GTPs	0.01	61.17	7.26
Alkynyl-GTPs	3.64	61.03	7.42
<i>S</i> -GPs	4.1	60.92	7.52

The content of PolySM in *S*-GPs can be determined based on the N content.

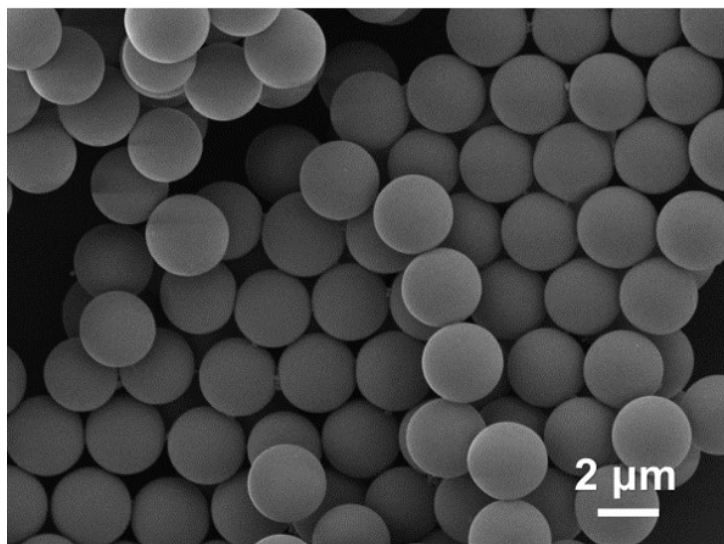
$$\text{Content of PolySM (wt\%)} = (N_{S\text{-GPs}}\% - N_{\text{Alkynyl-GTPs}}\%)/(N_{\text{M}}\% - N_{\text{Alkynyl-GTPs}}\%) = 11.9 \text{ wt\%}$$

**Table S3.** The elemental analysis data for PGMA seeds, RTPs, alkynyl-RTPs and *S*-RPs.

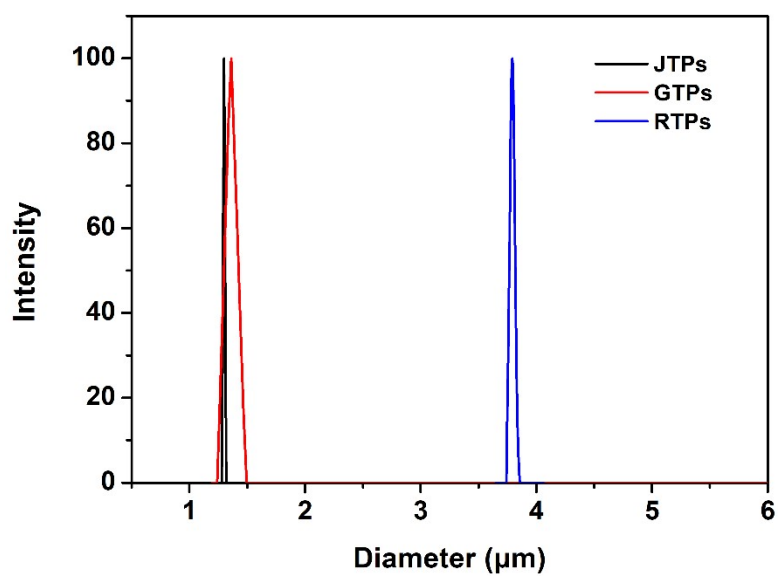
	N [%]	C [%]	H [%]
PGMA seeds	0.01	58.59	7.2
RTPs	0.01	80.43	7.64
Alkynyl-RTPs	1.48	78.83	7.88
<i>S</i> -RPs	2.22	78.48	7.63

The content of PolySM in *S*-RPs can be determined based on the N content.

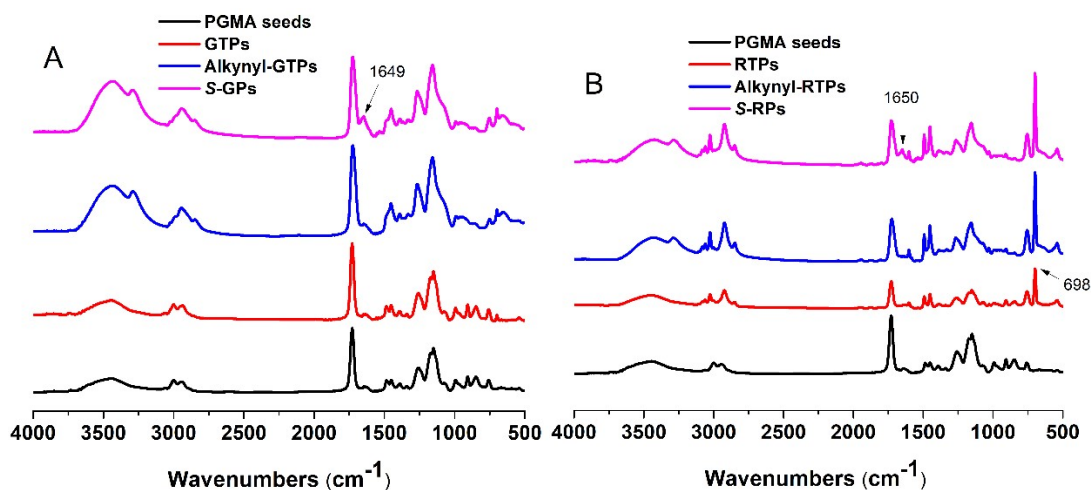
$$\text{Content of PolySM (wt\%)} = (N_{S\text{-RPs}}\% - N_{\text{Alkynyl-RTPs}}\%)/(N_{\text{M}}\% - N_{\text{Alkynyl-RTPs}}\%) = 12.3 \text{ wt\%}$$



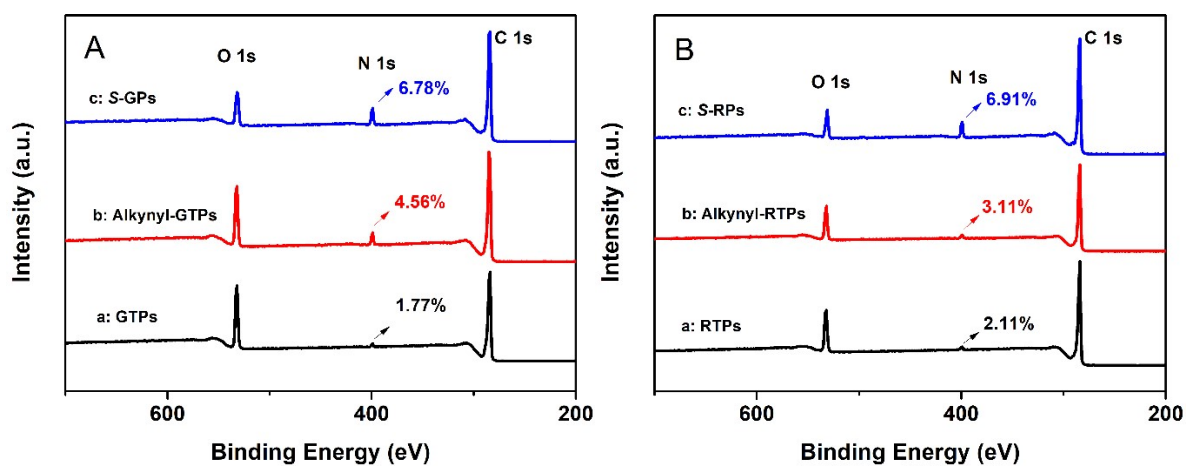
**Figure S1.** SEM image of PGMA seed particles.



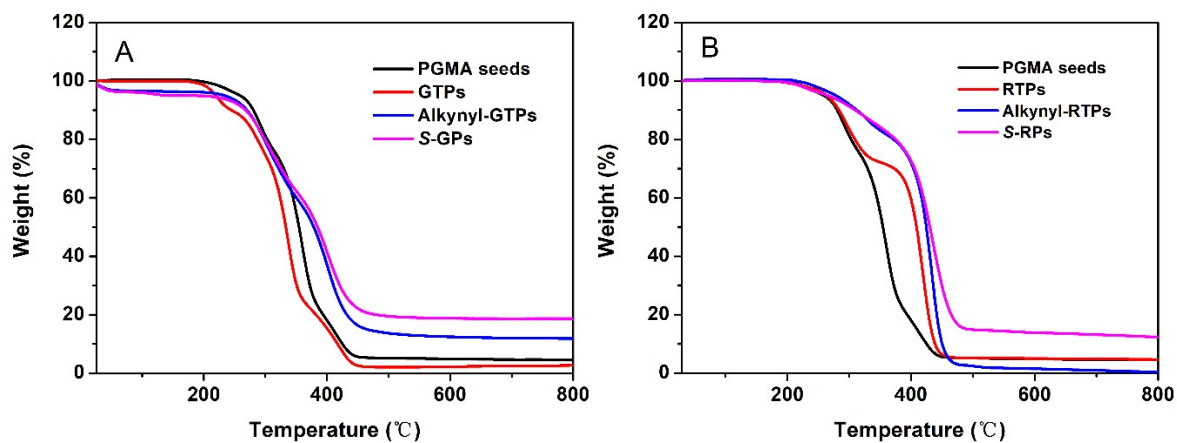
**Figure S2.** DLS size distribution of JTPs, GTPs, and RTPs.



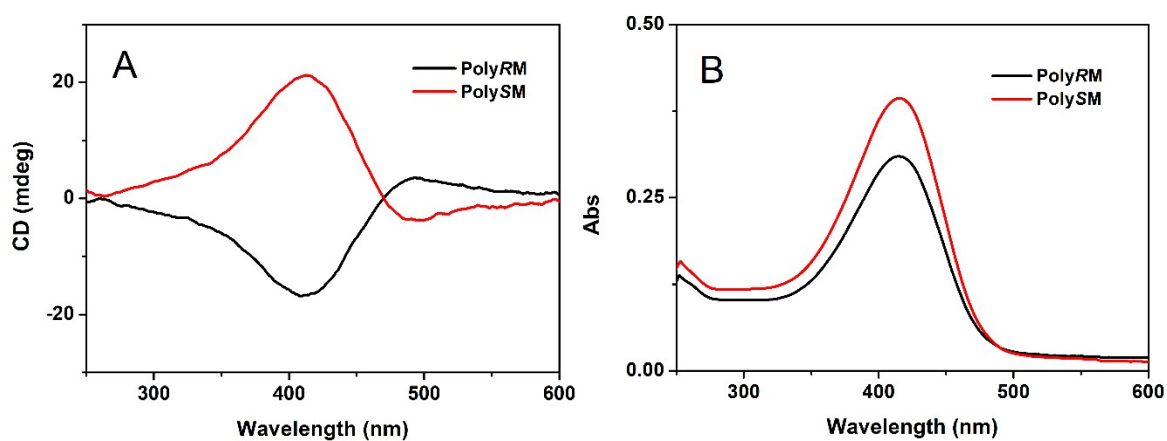
**Figure S3.** Typical FT-IR spectra of (A) PGMA seed particles, GTPs, alkynyl-GTPs, and *S*-GPs; (B) PGMA seed particles, RTPs, alkynyl-RTPs, and *S*-RPs.



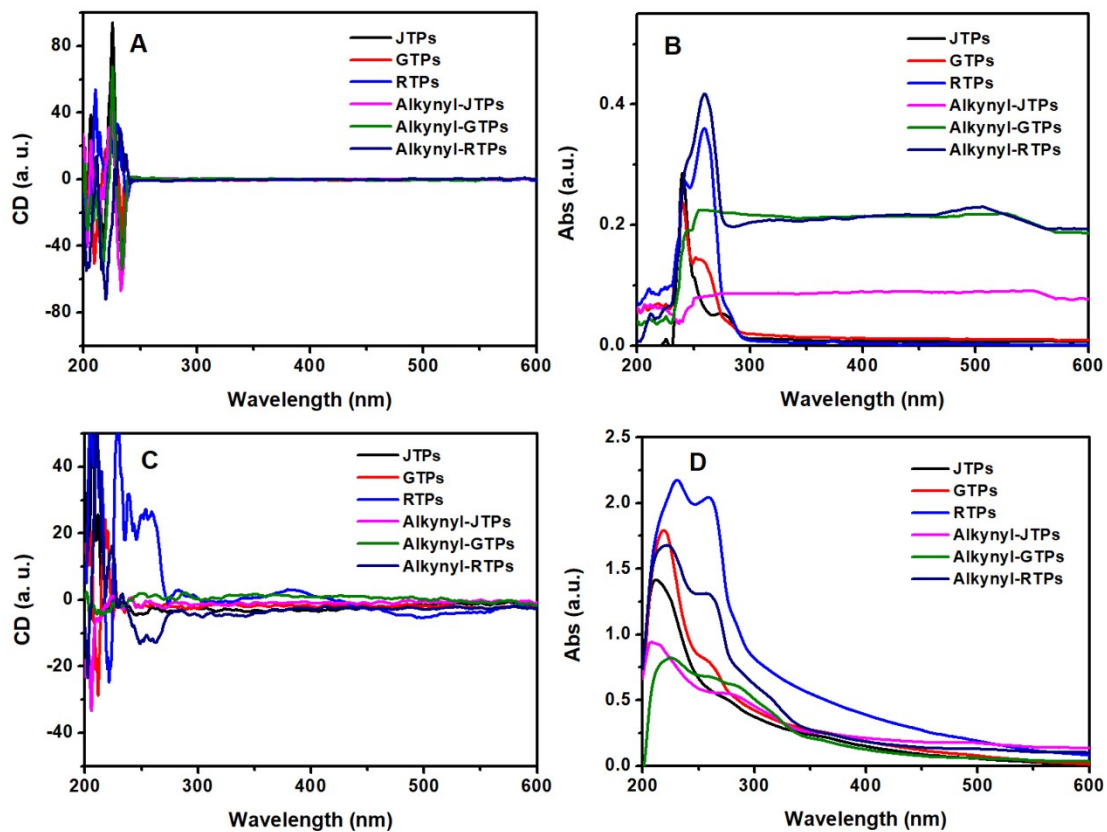
**Figure S4.** XPS spectra recorded on the surface of (A) GTPs, alkynyl-GTPs, and *S*-GPs; (B) RTPs, alkynyl-RTPs, and *S*-RPs.



**Figure S5.** TGA curves of (A) GTPs, alkynyl-GTPs, and *S*-GPs; (B) RTPs, alkynyl-RTPs, and *S*-RPs.



**Figure S6.** CD (A) and UV-vis absorption (B) spectra of PolyRM and PolySM in CHCl<sub>3</sub> solution ( $c = 0.17$  mM, by the M unit).



**Figure S7.** CD (A and C) and UV-vis absorption (B and D) spectra of JTPs, GTPs, RTPs, alkynyl-JTPs, alkynyl-GTPs and alkynyl-RTPs. Samples were tested by dispersing them in CHCl<sub>3</sub> solution (A and B) and in KBr tablet form (C and D) at room temperature.