**Supporting Information**

**Responsive microgels based on RAFT-HDA dynamic covalent bonding**

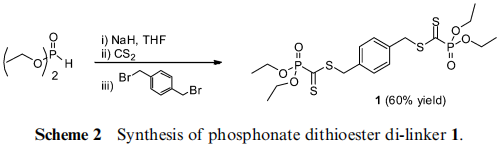
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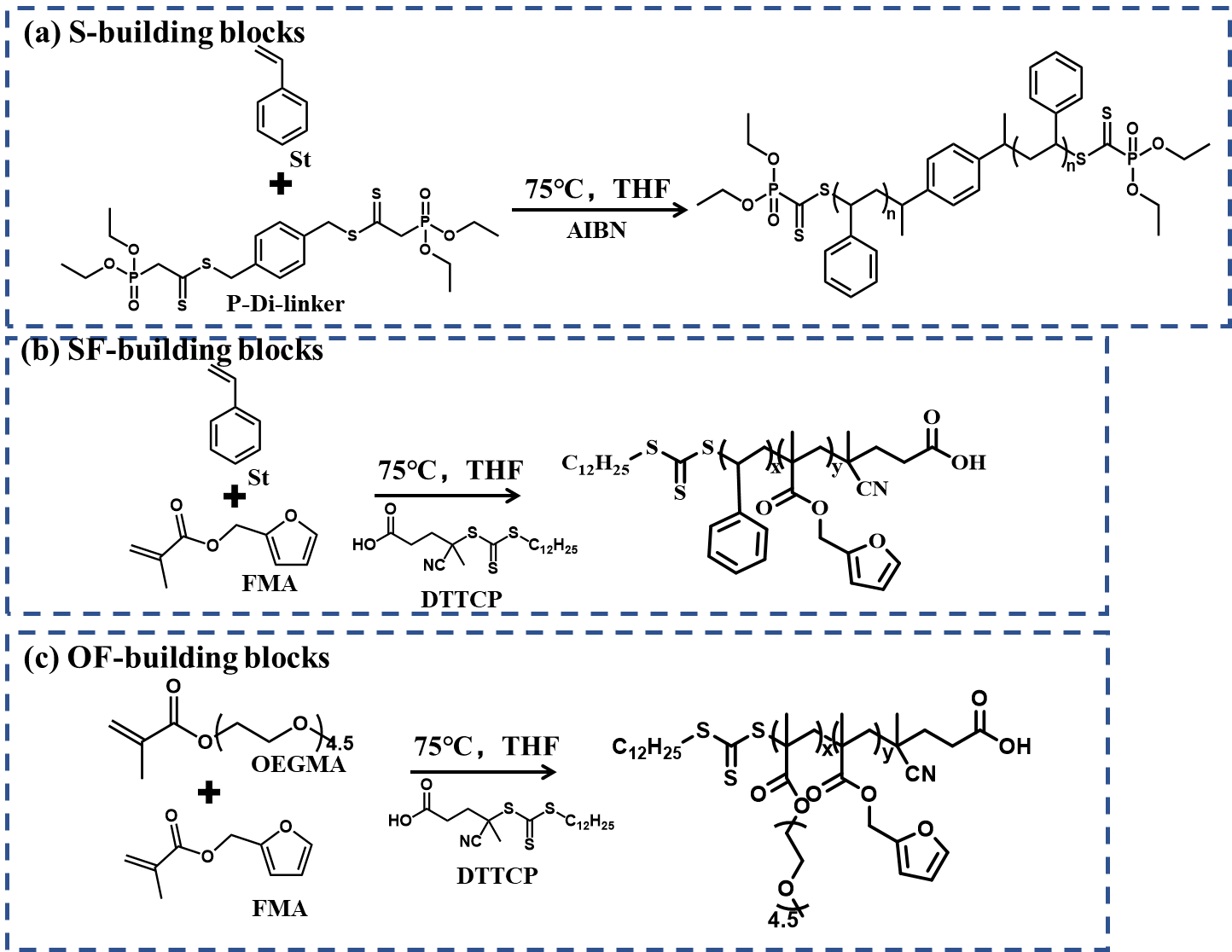
**2 China Electric Power Research Institute Co. Ltd.; shaoshuai@epri.sgcc.com.cn**

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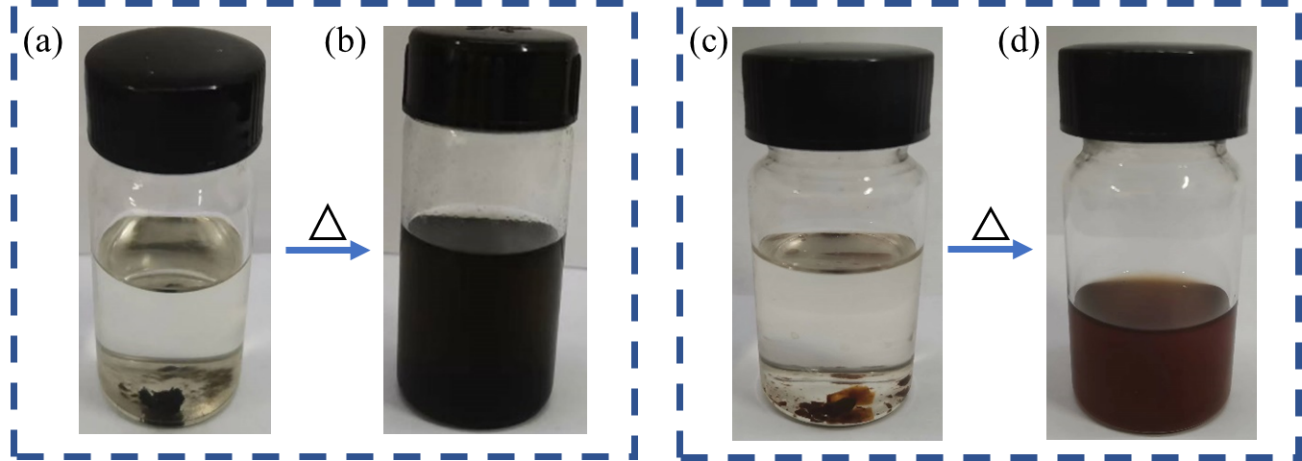
Keywords: responsive microgels, hetero Diels-Alder (HDA) reactions, dynamic covalent bonding



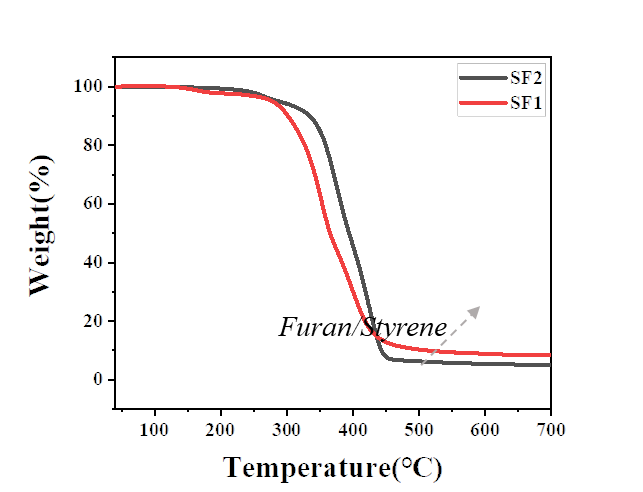
**Scheme. S1**. Synthetic routes of (a) 1,4-phenylenebis (methylene) bis((diethoxyphosphoryl)methanedithioformate) (P-Di-linker)



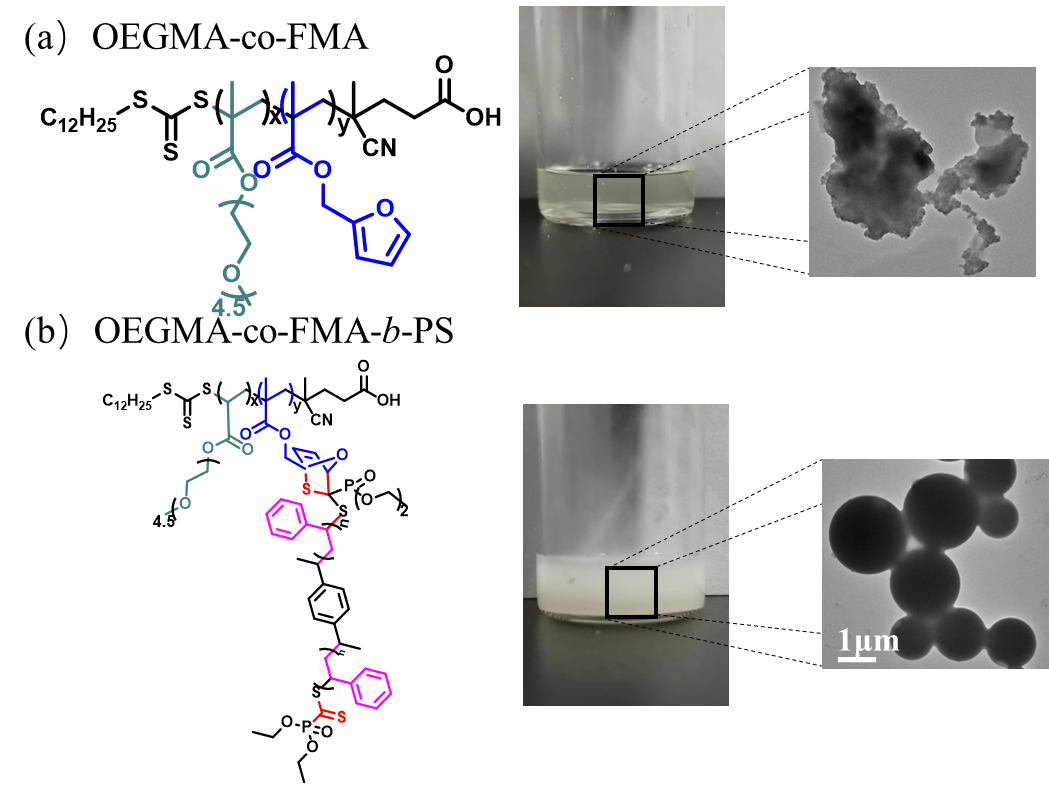
**Scheme. S2**(a-c) Synthetic routes of building blocks.



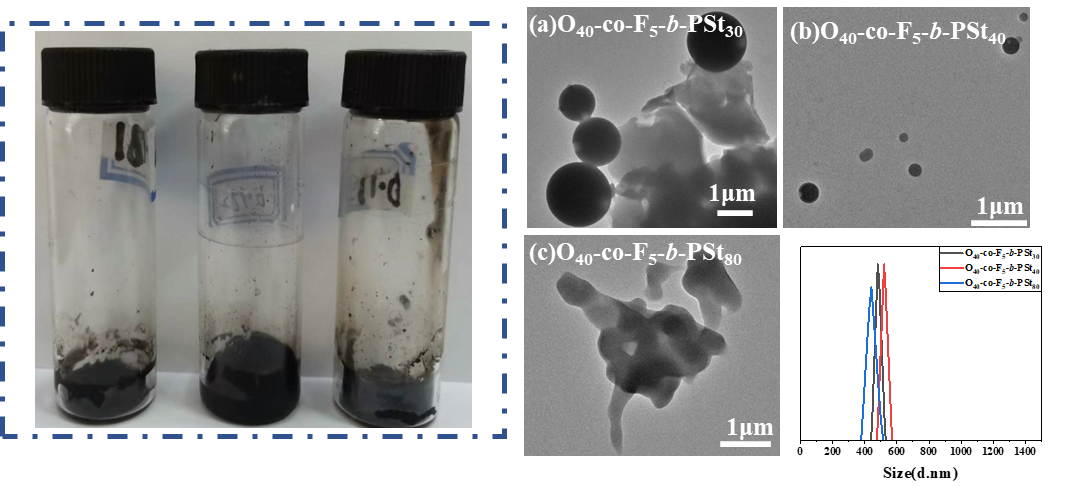
**Figure S1** (a) DA product soaked in toluene at room temperature for 5 days. (b) DA product heated in toluene 120℃ for 2h. (c) DA product soaked in THF at room temperature for 5 days. (d) DA product heated in toluene 120℃ for 8h.



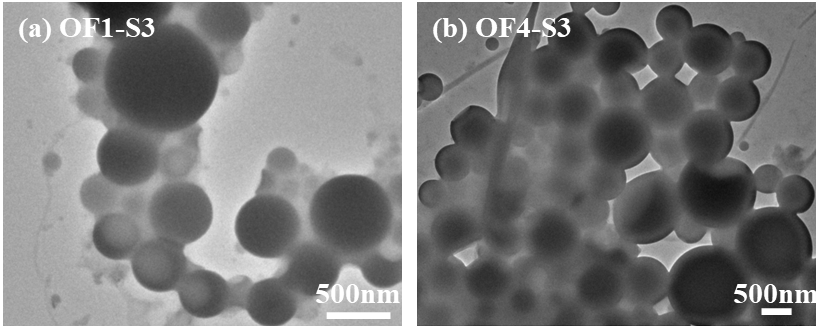
**Figure S2** Comparative thermal weight loss spectra of SF1 and SF2 systems.



**Figure S3**(a) OEGMA and FMA copolymer. (b) Furan with dithioester HDA to obtain OEGMA-co-FMA-b-PS.



**Figure S4**



**Figure S5** TEM images of microgels after 36 days at room temperature.