Electronic Supporting information

Synthesis and Self-assembly of ABC linear triblock copolymers to target CO2responsive multicompartment micelles

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1. Determination of molecular weight by UV spectroscopy

Figure S1. Linear relationship of absorbance and concentration of terthioester end group.

The π - π transition of the z-group in the RAFT chain transfer agent has significant UV absorption, so the molar quantity of polymers in solution can be detected from UV signal. Then for a given polymer weight in solution, the number average molecular weight \overline{M}_n can be calculated accordingly.¹ The experiment details are described as follows.

A series of CH₂Cl₂ solution of CTA was prepared and collect their absorbance with UV-vis spectrophotometer (UV-480, Unico, China). Thereafter, the relationship of absorbance and concentration of terthioester end group can be constructed with the concentration of chain transfer agent (λ =292 nm, CH₂Cl₂ as solvent) as shown in **Figure S1**. An equation was targeted as y=27629x (R²=0.9981). According to Beer's low, A= ϵ bc, in which ϵ is molar

absorption index, b is weight of cuvette (1 cm here), c is the concentration (mol·L⁻¹). Here the ϵ =27629 [X]. If we take m_i (mg) polymer and dissolve it into V_i (mL) solvent, and then determine the constant A, the \overline{M}_n can be calculated as following equation.

$$\overline{M_n} = \frac{m_i \times 10^{-3}}{\frac{A}{27629} \times V_i \times 10^{-3}} \text{ (g/mol)}$$
(1)

2. Additional TEM images of partial triblock copolymers

Before CO₂ bubbling

 $O_{113}F_{57} E_{114}$

 $O_{113}F_{57} \to I_{121}$

 $O_{113}F_{57} \to E_{201}$



After CO₂ bubbling





Before CO₂ bubbling

After CO₂ bubbling

Figure S2. TEM images of triblock copolymers self-assemblies in aqueous solution before (left) and after (right) bubbling CO_2 .

3. Additional TEM images of $O_{113}F_{110}E_{192}$ under the stimulation of CO_2



Figure S3. Additional TEM images of $O_{113}F_{110}E_{192}$ under the stimulation of CO_2

References

1. J. N. Marsat, M. Heydenreich, E. Kleinpeter, H. V. Berlepsch, C. Bottcher and A. Laschewsky, *Macromolecules*, 2011, 44, 2092-2105.