Supporting Information
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Supporting Information

Synthesis of Alkyne-terminated PCDA Linker for Applying Click Chemistry on PDA Layers

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<Contents>

Supporting Figure 1. 1H NMR of compound C

Supporting Figure 2. 1H NMR and IR of compound D

Supporting Figure 3. Thermochromic transition of the control test

Explanation 1. Preparation of compound E

Explanation 2. Thermochromic transition of the liposomes produced from compound E + PCDA (1:9)

Supporting Figure 4. Thermochromic transition of the liposomes produced from compound E + PCDA (1:9)
Supporting Figure 1. $^1$H NMR of compound C

Supporting Figure 2. $^1$H NMR and IR of compound D

Supporting Figure 3. Thermochromic transition of the control test
When we performed a control test at the same click reaction condition without benzyl azide to check the influence of Cu salt on the liposomes, we could not observe thermochromic reversibility, which means that Cu salt itself did not affect the thermochromic property of the liposomes.

**Explanation 1. Preparation of compound E**

To the solution of D (40 mg, 70 µmol) and benzyl azide (11 mg, 80 µmol) in 2 ml of t-butanol:water (1:1), 100 µl of 0.1 M ascorbic acid aqueous solution and 500 µl of 0.01 M CuSO₄⋅5H₂O aqueous solution were added. The reaction mixture was stirred at 30 °C for 12 h. The product was extracted with methylene chloride. After removing the solvent, we obtained the major product, E, by precipitation with ethyl acetate. We could identify the product E with the appearance of the aromatic protons in ¹H NMR and disappearance of the representative peaks of terminal alkyne C-H stretching at 3291 cm⁻¹ and terminal alkyne triple bond stretching at 2359 cm⁻¹.
Explanation 2. Thermochromic transition of the liposomes produced from compound E + PCDA (1:9)

After making the liposomes with compound E and PCDA in a typical method, we performed the thermochromic transition test to confirm these liposomes behave similarly as Phase II and we could observe that these liposomes also showed thermochromic reversibility (Supporting Fig. 4, a). But the reversible color transition in our model reaction was not so strong like Phase II. And also at this time, we could not detect any influence of Cu salt to the thermochromic property of the liposomes (Supporting Fig. 4, b).

Supporting Figure 4. Thermochromic transition of the liposomes produced from compound E + PCDA (1:9)