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聚联乙炔囊泡负载的 Bola 型两亲分子识别三聚氰胺过程中 Chaotrope 促进型显色机制及热力学

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Chaotrope-Assisted Color Visualization Mechanism and Thermodynamics Involved in Molecular Recognition of Melamine by Bolaamphiphiles Embedded in Polydiacetylene Vesicles

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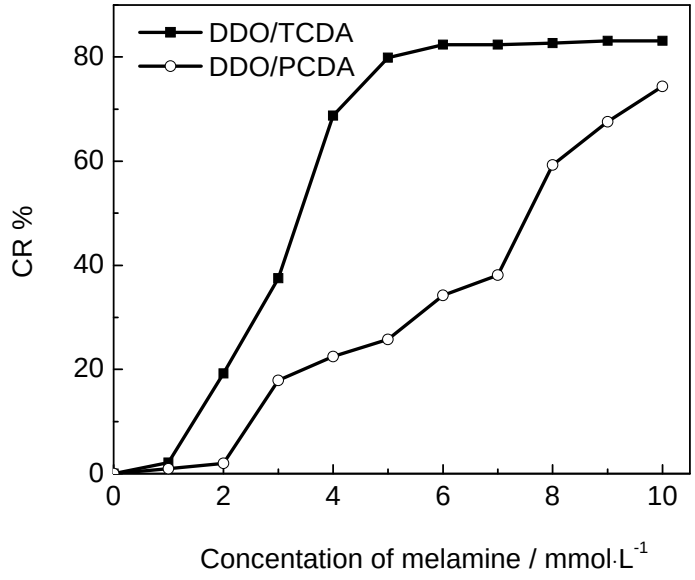

Fig.S1 Colorimetric response (CR) of DDO/ PCDA and DDO/TCDA matrix after 30 h of incubation time

TCDA and PCDA concentrations used were 0.5 mmol·L^{-1}, and the amount of DDO used in both matrices was 0.025 mmol·L^{-1}.

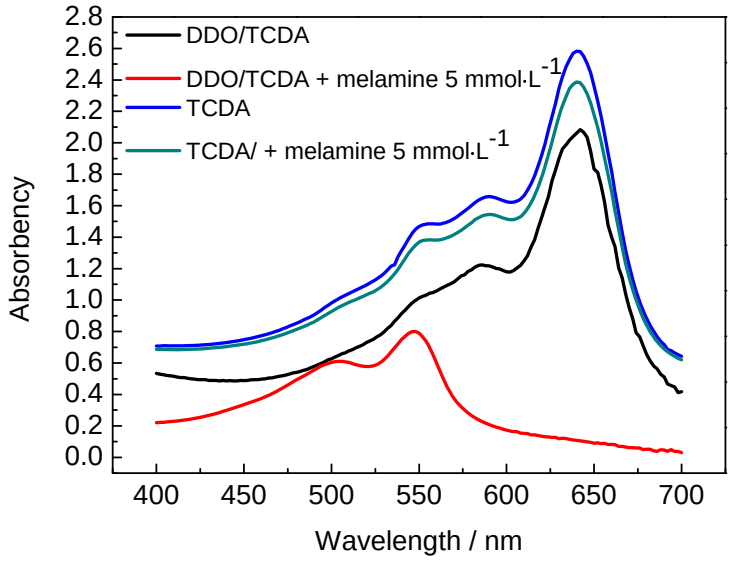

Fig.S2 UV-visible absorption spectra of TCDA vesicle solutions for various combinations of TCDA, DDO and melamine

TCDA, DDO and melamine concentrations used were 0.5 mmol·L^{-1}, 0.025 mmol·L^{-1} and 5 mmol·L^{-1} respectively. Incubation time is 1 h.

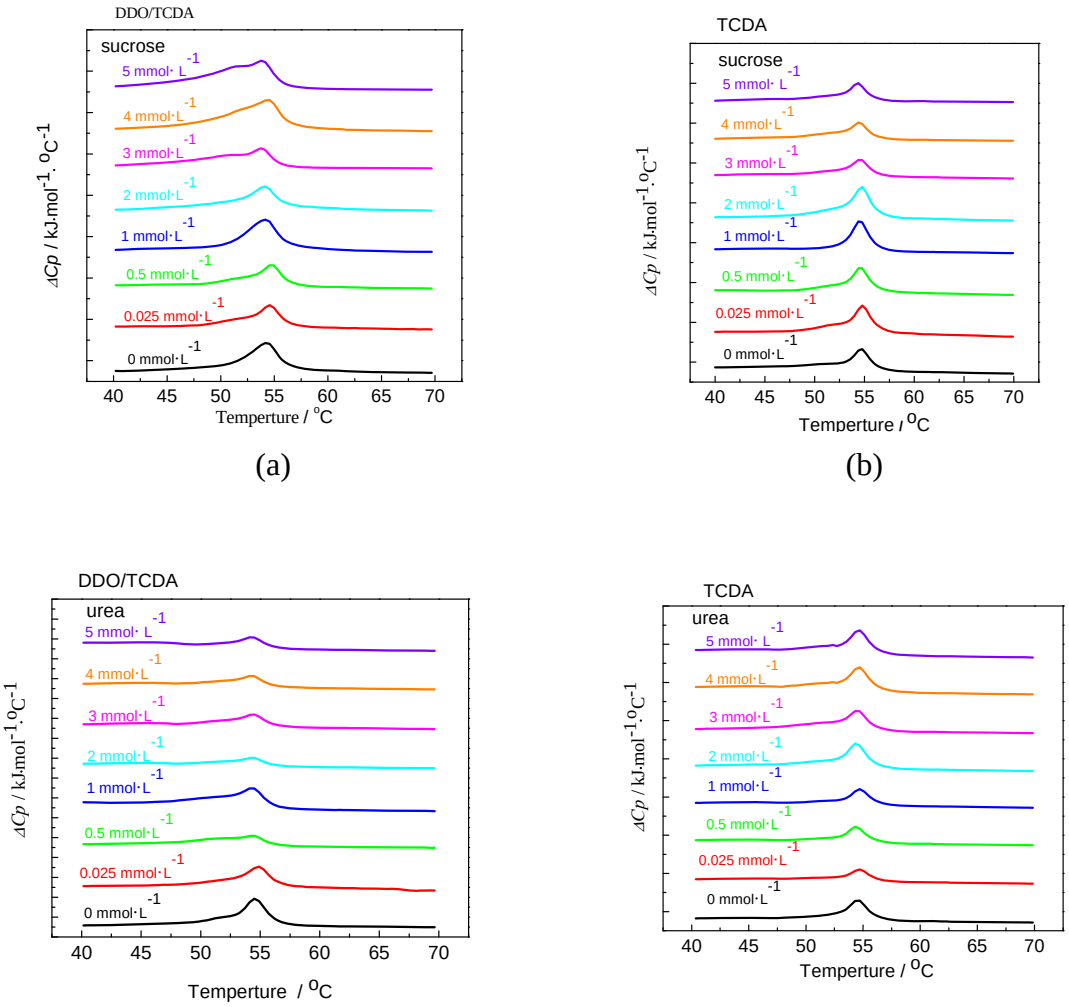

Fig.S3 DSC profiles of *ΔCp* vs *T* for the main-phase transition of DDO/TCDA and TCDA vesicle dispersions with the addition of sucrose and urea

DDO: 0.025 mmol·L^{-1}, TCDA 0.5 mmol·L^{-1}. *ΔCp* traces have been shifted vertically for clarity.

Control experiment for the investigation of the mechanisms involved in chaotrope-assisted color transition of DDO/TCDA vesicles

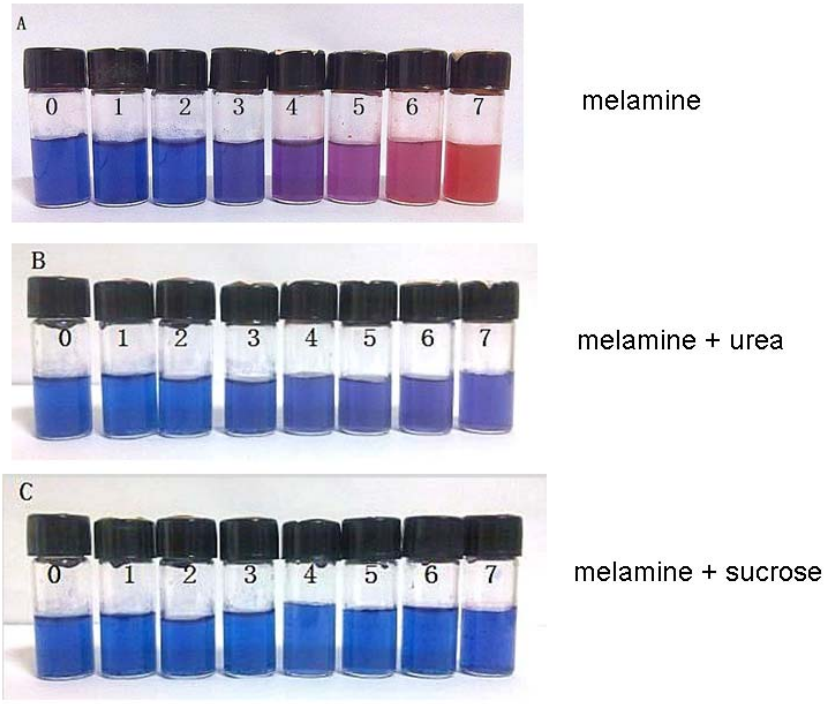

Fig.S4 The image of color transition of DDO/TCDA vesicles in the presence of melamine, melamine with urea, melamine with sucrose respectively

Incubation time is 1 h, TCDA 0.5 mmol·L^{-1}, DDO 0.025 mmol·L^{-1}.

The additives are melamine for A series, melamine with urea for B series and melamine with sucrose for C series respectively. The concentration of additives in the vesicle solution indicated as sample number 0-7.

A series: the concentrations of melamine are 0 mmol·L^{-1}, 0.025 mmol·L^{-1}, 0.05 mmol·L^{-1}, 1 mmol·L^{-1}, 2 mmol·L^{-1}, 3 mmol·L^{-1} ,4 mmol·L^{-1}, 5 mmol·L^{-1}.

B series: the concentrations of additives are 0 mmol·L^{-1}, 0.025 mmol·L^{-1} melamine, 0.05 mmol·L^{-1} melamine, 0.05 mmol·L^{-1} melamine and 0.95 mmol·L^{-1} urea, 0.05 mmol·L^{-1} melamine and 1.95 mmol·L^{-1} urea, 0.05 mmol·L^{-1} melamine and 2.95 mmol·L^{-1} urea, 0.05 mmol·L^{-1} melamine and 3.95 mmol·L^{-1} urea, 0.05 mmol·L^{-1} melamine and 4.95 mmol·L^{-1} urea.

C: series: the concentrations of additives are 0 mmol·L^{-1}, 0.025 mmol·L^{-1} melamine, 0.05 mmol·L^{-1} melamine, 0.05 mmol·L^{-1} melamine and 0.95 mmol·L^{-1} sucrose, 0.05 mmol·L^{-1} melamine and 1.95 mmol·L^{-1} sucrose, 0.05 mmol·L^{-1} melamine and 2.95 mmol·L^{-1} sucrose, 0.05 mmol·L^{-1} melamine and 3.95 mmol·L^{-1} sucrose, 0.05 mmol·L^{-1} melamine and 4.95 mmol·L^{-1} sucrose.

It can be seen from Fig. S3 that the sample 3 in A series and B series started to change color in the presence of melamine or melamine with urea. And the CR value of these vesicles was shown in Fig. S5.

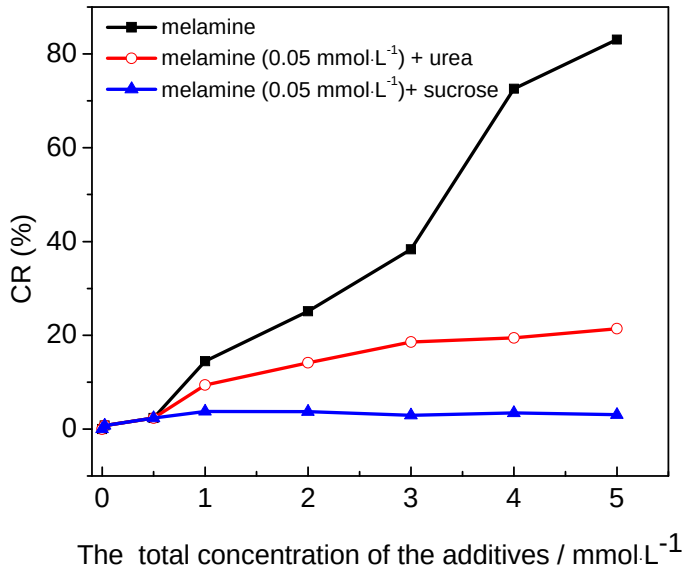

Fig.S5 Quantitative determination of the colormetric response(CR) of DDO/TCDA vesicles in the presence of melamine, melamine with urea, melamine with sucrose respectively

In the presence of urea and sucrose, melamine concentration was set at 0.05 mmol·L^{-1}. TCDA 0.5 mmol·L^{-1}, DDO 0.025 mmol·L^{-1}. Incubation time is 1 h.

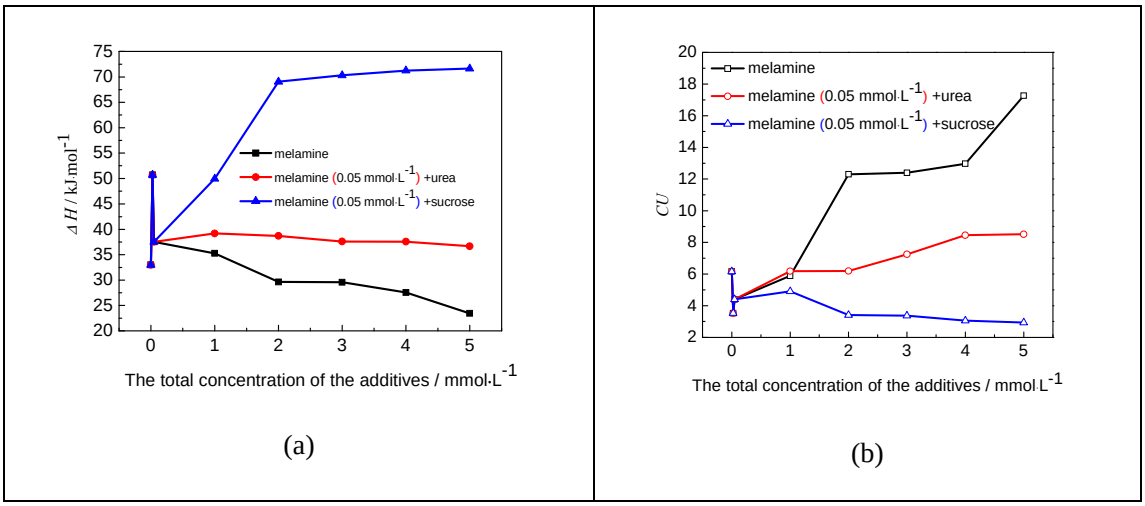

Fig.S6 Calorimetric enthalpy change (*ΔH*) and cooperative unit (*CU*) of DDO/TCDA vesicles with the addition of melamine, melamine with urea and melamine with sucrose respectively