Controlled Self-organization of Cyanostilbene: Emission Tuning and Photo-responsiveness

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Supporting Information

Experimental section

Preparation of the CMD nanostructures

The 10^{-2} mol/L mother solution of CMD was prepared by dissolving certain molar quantities of powder CMD in THF directly. Then the mother solution was diluted into $1x10^{-4}$ mol/L with deionized water. After that, the diluted solution was stabilized for several hours before characterization. Finally, the CMD nanostructures were prepared through changing the ratio of THF and water at room temperature.

Characterizations

TEM images were carried out on a JEM-100CX electron microscope from JEOL Ltd. AFM testing was conducted with a Veeco Nanoscope Multimode III SPM and operated in tapping contact mode at ambient temperature. The AFM sample was dropped on the smooth silicon wafer and dried by freeze drying for 5 days. The average diameter of vesicles was recorded by DLS measurement with a Wyatt QELS Technology DAWN HELEOS instrument, which used a 12-angle replaced detector in a scintillation vial and a 50 mW solid-state laser. The water for preparation samples of DLS was filtered by a 0.45 μm filter and samples of DLS were also filtered by a 0.45 μm filter before testing. UV-vis curves were obtained at room temperature with a U-4100 UV-vis spectrophotometer. The certain concentration of solution was poured into quartz cuvette to detect the absorption peaks. Fluorescence emission spectra were recorded on F-7100 fluorescence spectrophotometer. ^{1}H NMR spectra was measured on an API Bruker Avance 300M NMR spectrometer at room temperature.

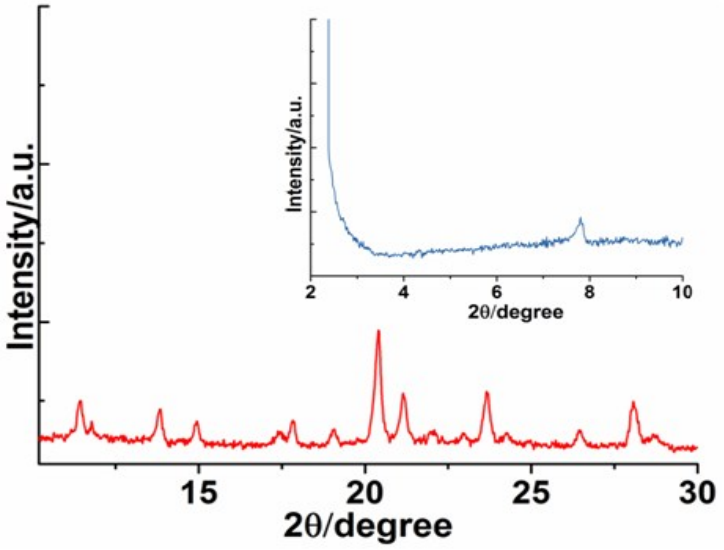

Fig. S1 Wide-angle X-ray diffraction pattern of dried nanofibers in THF/H_2O mixed solution, small-angle X-ray diffraction pattern (inset).

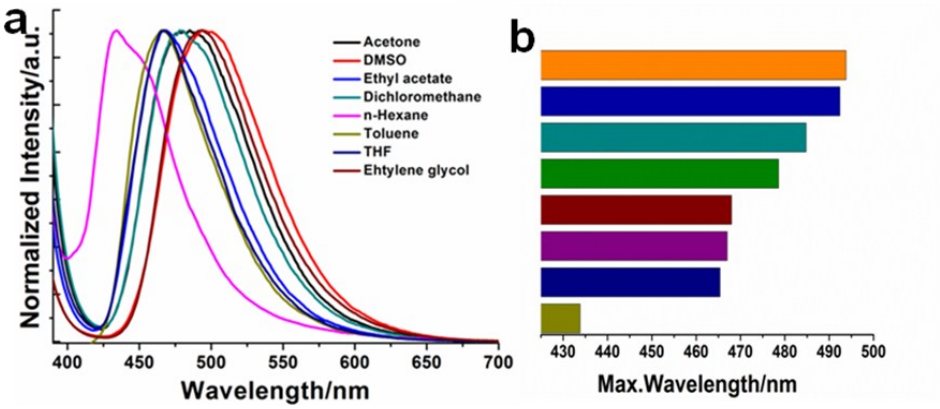

Fig. S2 (a) Emission spectra of CMD in different organic solvents (Concentration =1x10^{-4}mol/L). (b) The maximum emission wavelength of CMD (from bottom to top: n-hexane, toluene, THF, ethyl acetate, dichloromethane, acetone, ethylene glycol, DMSO).

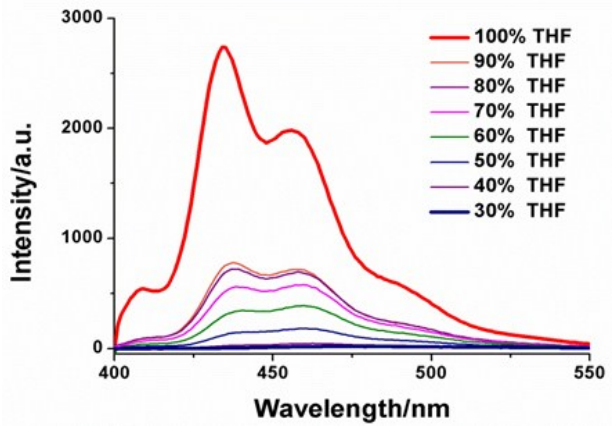

Fig. S3 Emission spectra (excitated at 375 nm) of CMD in mixed solvents of H_2O/THF. (0/10 to 9/1, v/v).

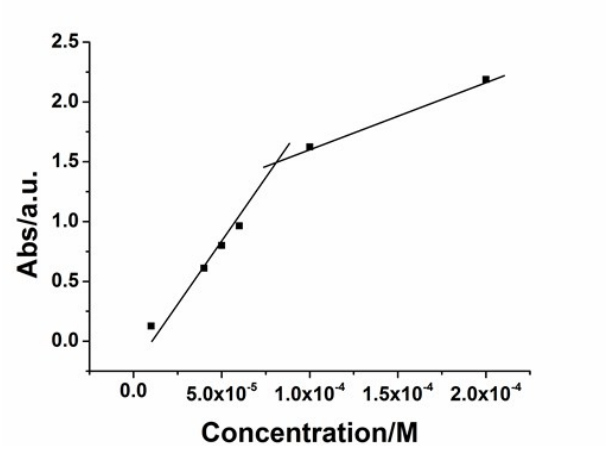

Fig. S4 The maximum absorption changes as a function of CMD concentrations in mixture solution of H_2O/THF (8/2, v/v).

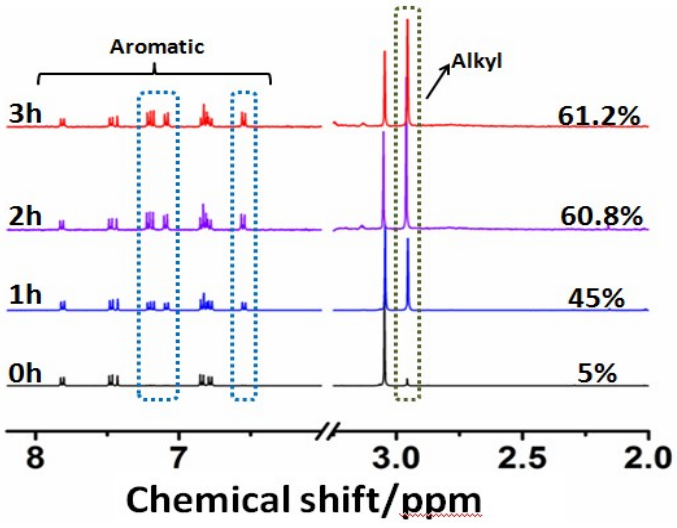

Fig. S5 ^1H NMR spectral comparison of CMD in acetone-D_6 under different UV irradiation time interval.

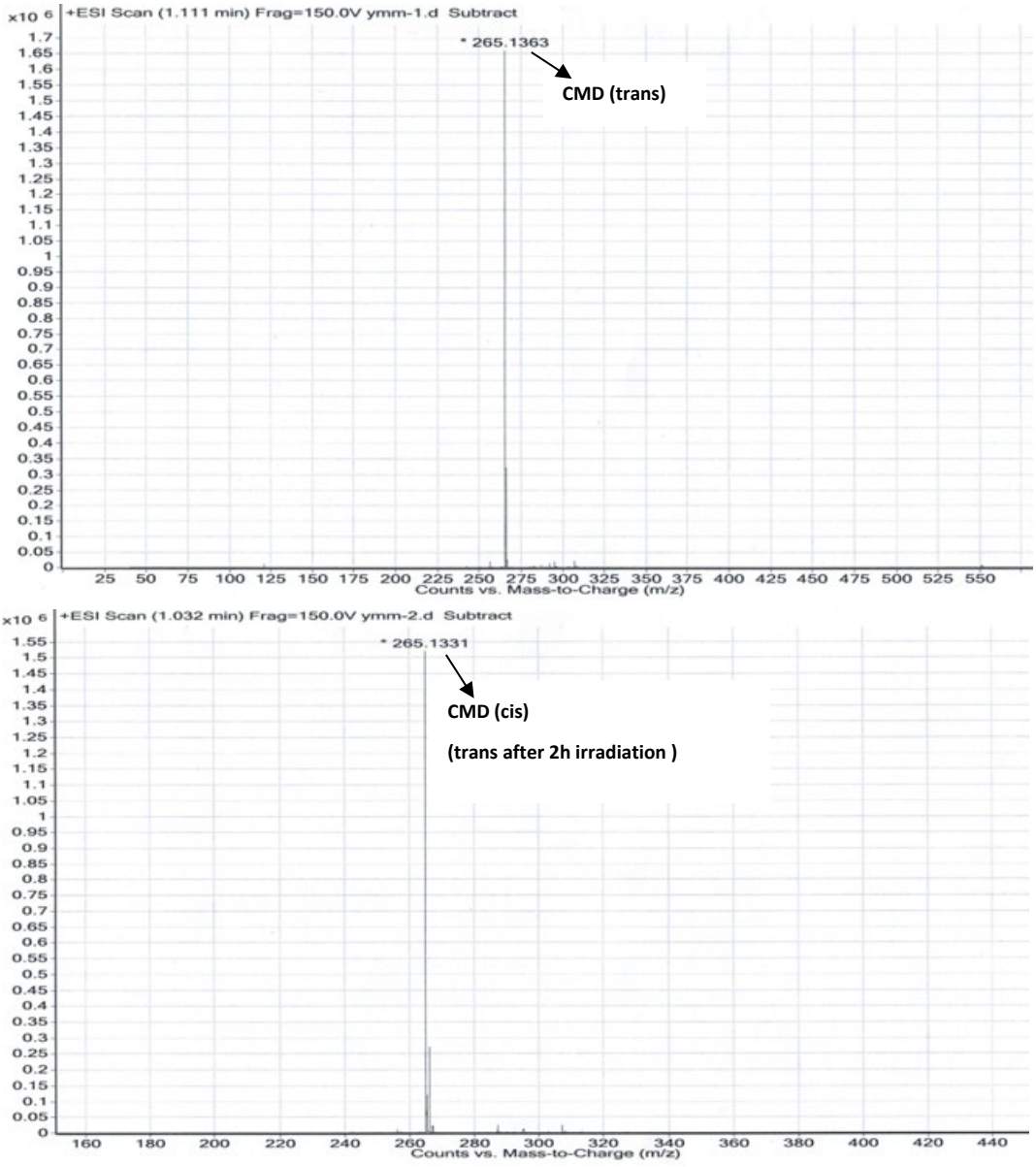

Fig. S6. MS spectra of CMD (a) at initial state and (b) after sufficient photoirradiation.

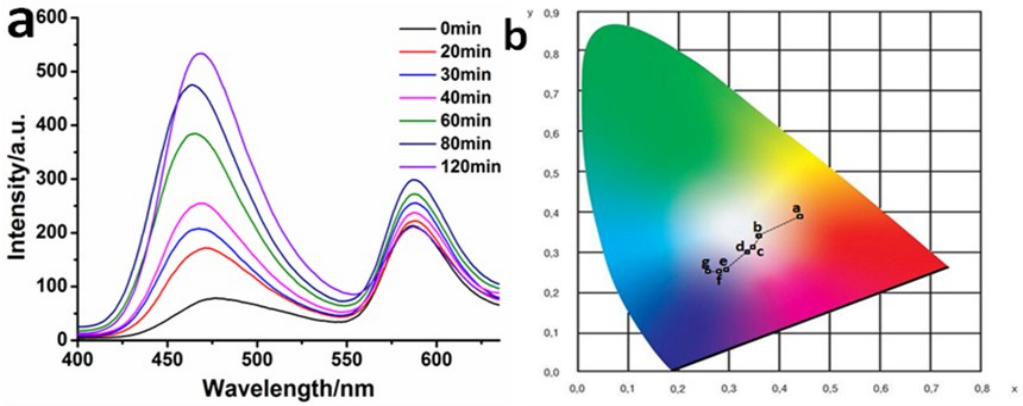

Fig. S7 (a) Emission spectrum Digital images of CMD--Rhodamine-B system with the increase

irradiation times under UV light (365 nm). (b) CIE 1931 chromaticity diagram. The black dots signify the luminescent color coordinates for corresponding states. [a] to [g] stand for the irradiation times of 0min, 20min, 30min, 40min, 60min, 80min, 120min respectively. CIE coordinates of [a] to [g] respectively: (0.4331, 0.3878), (0.3641, 0.3289), (0.3554, 0.3127), (0.33, 0.2977), (0.2981, 0.2633), (0.2867, 0.2507), (0.2494, 0.2516).