Supporting Information

1 Experimental Method

Infrared spectroscopy Fourier transform infrared (FT-IR) spectra were recorded using the Thermo Fisher Nicolet 6700 FT-IR spectrometer. The freeze-dried samples were prepared by KBr disc or film technique and the scan range was 4000–400 cm\(^{-1}\).

2 Results and Discussion

Fig. 1s FTIR spectra of 12-3-12·2Br-(a) and 12-3-12·2Br-/trans-OMCA (10mM: 8mM) sample after being irradiated with UV light for 0, 20, 60 or 100 min.

The FT-IR spectra of 12-3-12·2Br-/trans-OMCA samples (a: 12-3-12·2Br; b, c, d, e: 10mM12-3-12·2Br/8mMtrans-OMCA samples before and after being irradiated with UV light (20, 40 or 60 min) were acquired. As can be seen from the Fig. 1s, the 2921 cm\(^{-1}\) and 2852 cm\(^{-1}\) are symmetrical and asymmetrical stretching vibrations of the alkyl chain C-H bond. The 1494 cm\(^{-1}\) and 1471 cm\(^{-1}\) are in-plane bending vibrations of methyl and methylene groups. Those peaks are linked to 12-3-12·2Br(a). For the 12-3-12·2Br/ trans-OMCA sample, the FT-IR spectrum of sample without UV light irradiation are showed in curve b. and the c, d, e represent that the sample were illuminated 20, 40, 60min respectively. All spectra present the characteristic bands of the acrylic C=C vibration at 1634 cm\(^{-1}\) and 1555cm\(^{-1}\), and the =C-H in-plane bending modes are observed at 1374cm\(^{-1}\) and 1246cm\(^{-1}\), indicating that the trans-OMCA participates in the self-assembly of 12-3-12·2Br micelles. Trans and cis
isomers can be distinguished by the position of their acrylic out-of-plane =C-H bending bands located at 879 cm\(^{-1}\) \(^1\) and 837 cm\(^{-1}\) \(^2\), respectively. Fig.1s shows that the band at 879 cm\(^{-1}\) decreases and the intensity at 837 cm\(^{-1}\) increases with the prolongation of UV irradiation time. Furthermore, trans-OMCA presents a characteristic aromatic C-H in-plane bending vibration located at 996 cm\(^{-1}\), which decreases with the UV irradiation time. This change are coherent with photoisomerization of trans to cis \(^3\), indicating that the addition ofed trans-OMCA participate the formation of aggregates, and the photoisomerization of trans to cis induced by the UV light lead to change of self-assembly structure.

Fig. 2s FTIR spectra of 12-3-12·2Br-(a) and 12-3-12·2Br-/trans-OMCA (30mM: 10mM) sample after being irradiated with UV light for 0, 20, 60 or 100 min. The Fig.2s shows the FT-IR spectra of wormlike micelle sample (30:10) before and after UV light. The trend of spectral variation is consistent with Fig.1s.

References:

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[3] Pallares R M, Wang Y, Lim S H, et al. Nanomedicine, 2016, 11(21):2845-2860.