

# Diverse Colorimetric Changes of Polydiacetylenes with Cationic Surfactants and Their Mechanistic Studies

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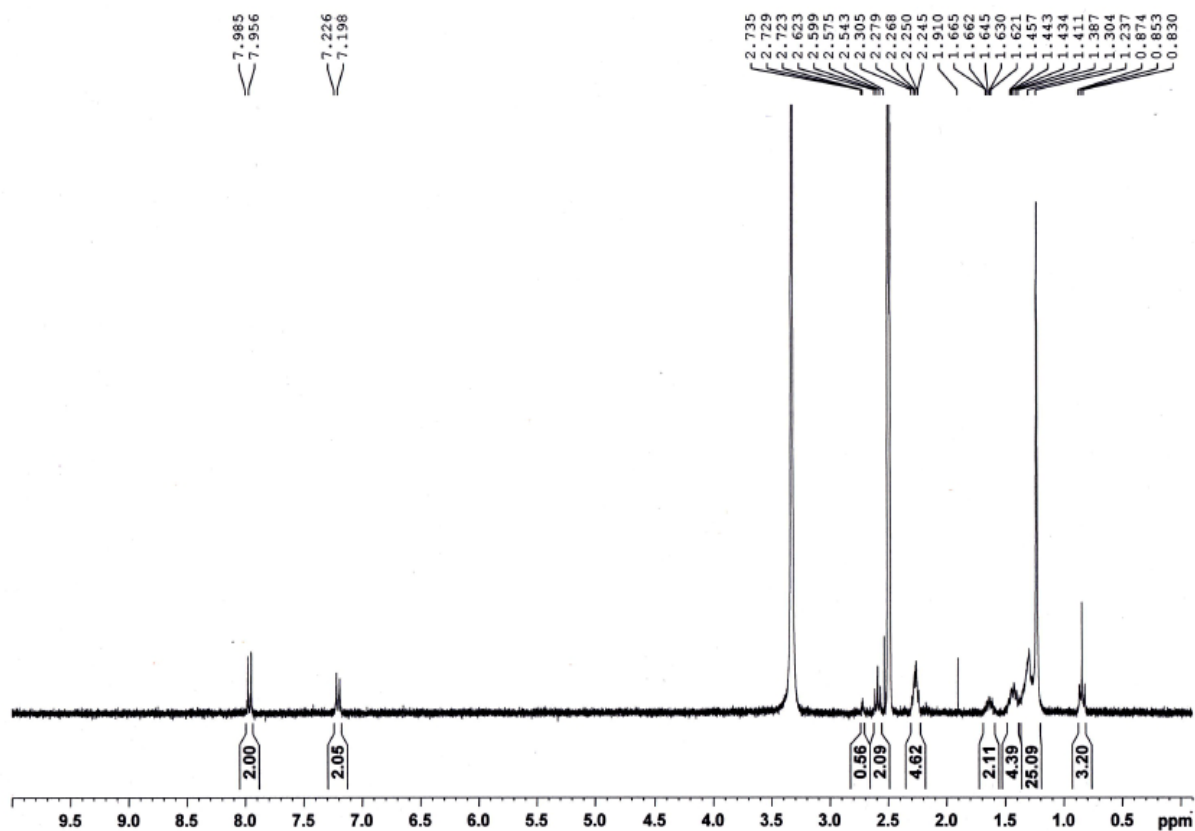


Fig. S1.  $^1\text{H}$  NMR (300 MHz) of compound PCDA-HBA in DMSO

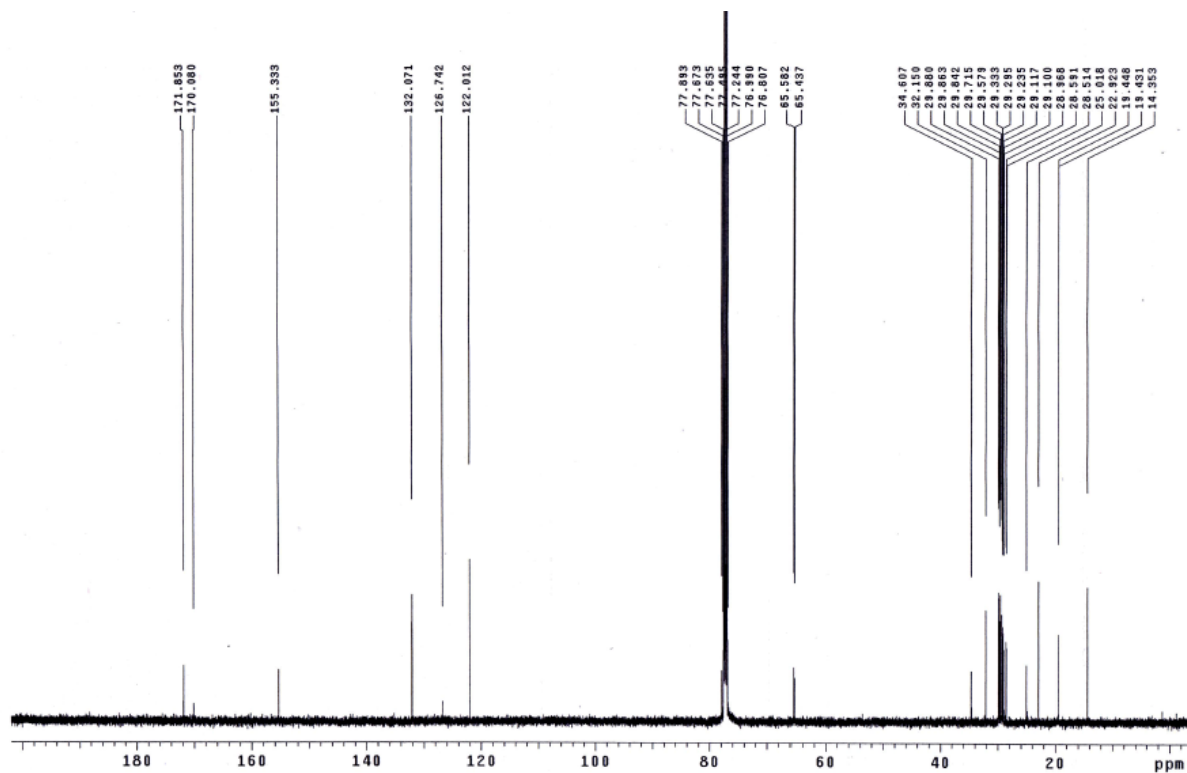


Fig. S2  $^{13}\text{C}$  NMR (62.5MHz) of compound PCDA-HBA in DMSO

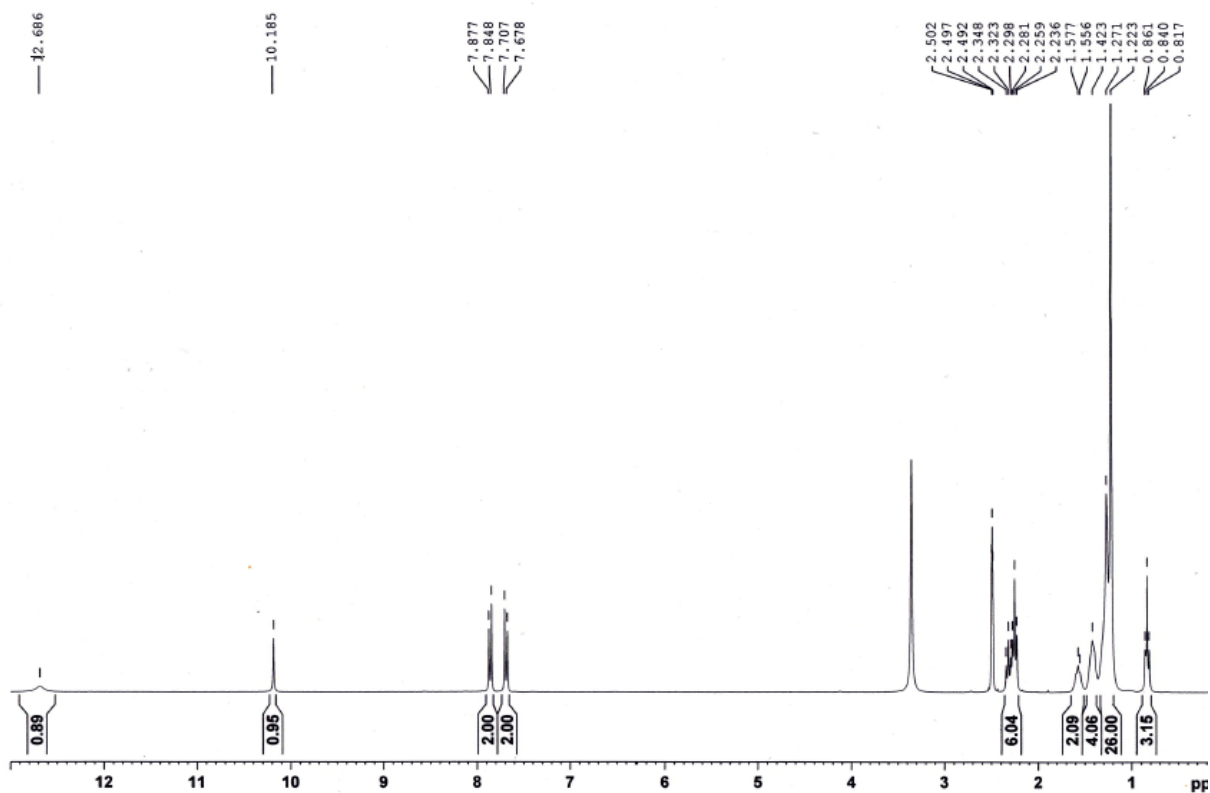


Fig. S3.  $^1\text{H}$  NMR (300 MHz) of compound PCDA-ABA in DMSO

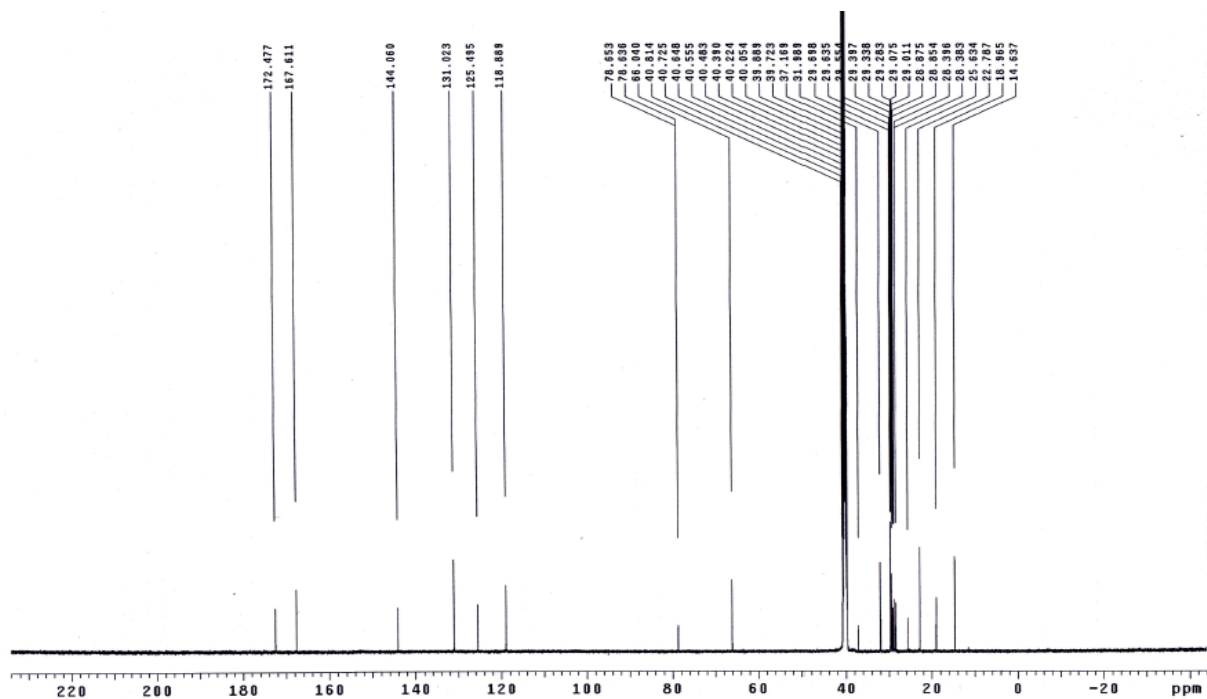


Fig. S4  $^{13}\text{C}$  NMR (62.5MHz) of compound PCDA-ABA in DMSO

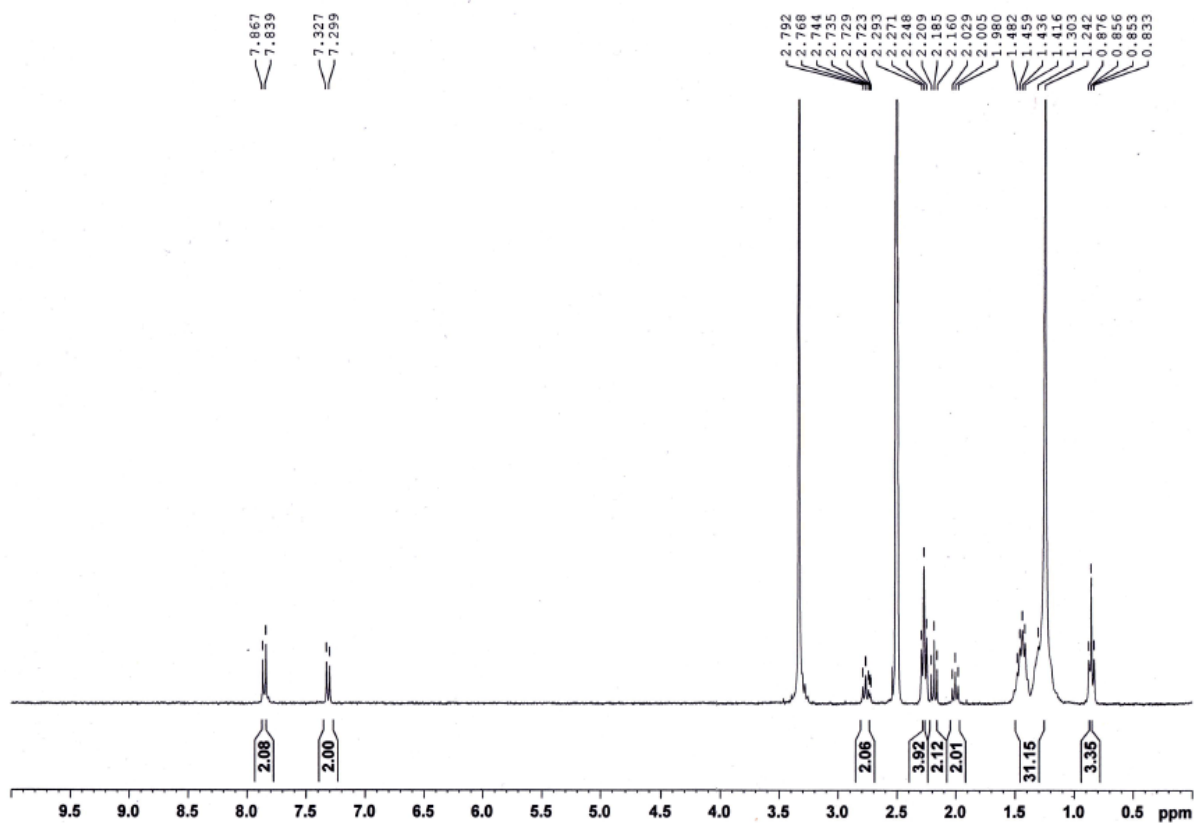


Fig. S5.  $^1\text{H}$  NMR (300 MHz) of compound PCDA-EBA in DMSO

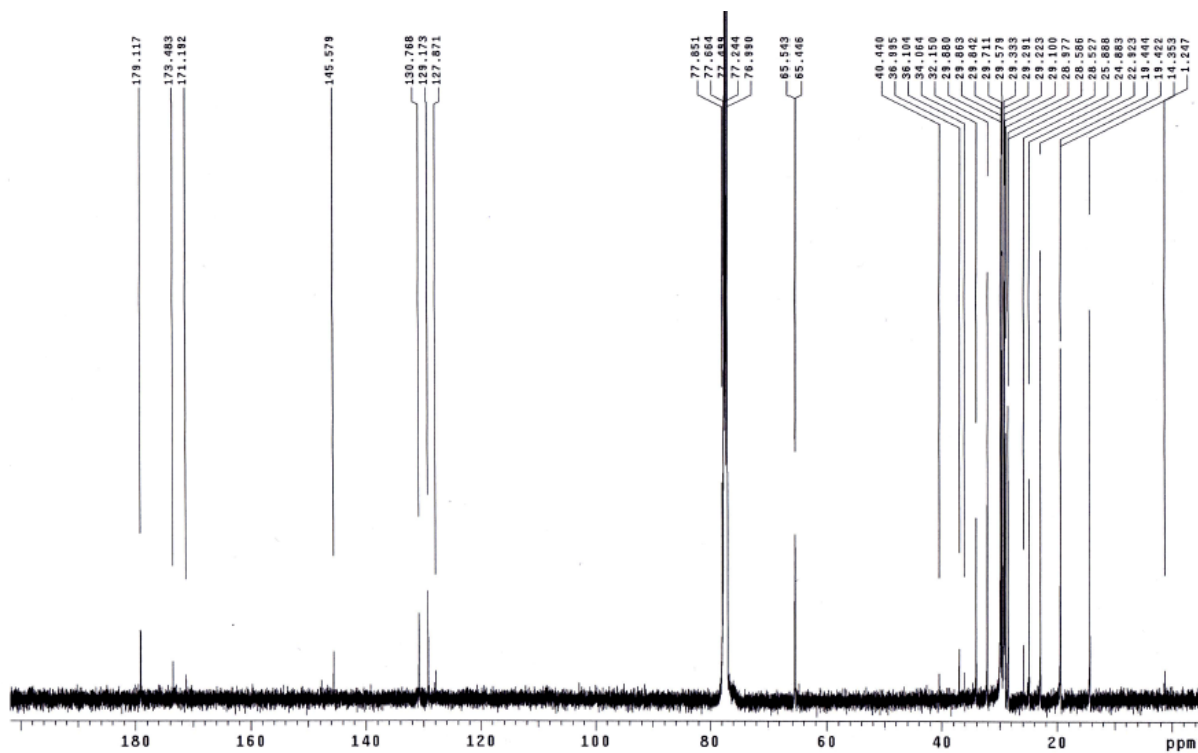
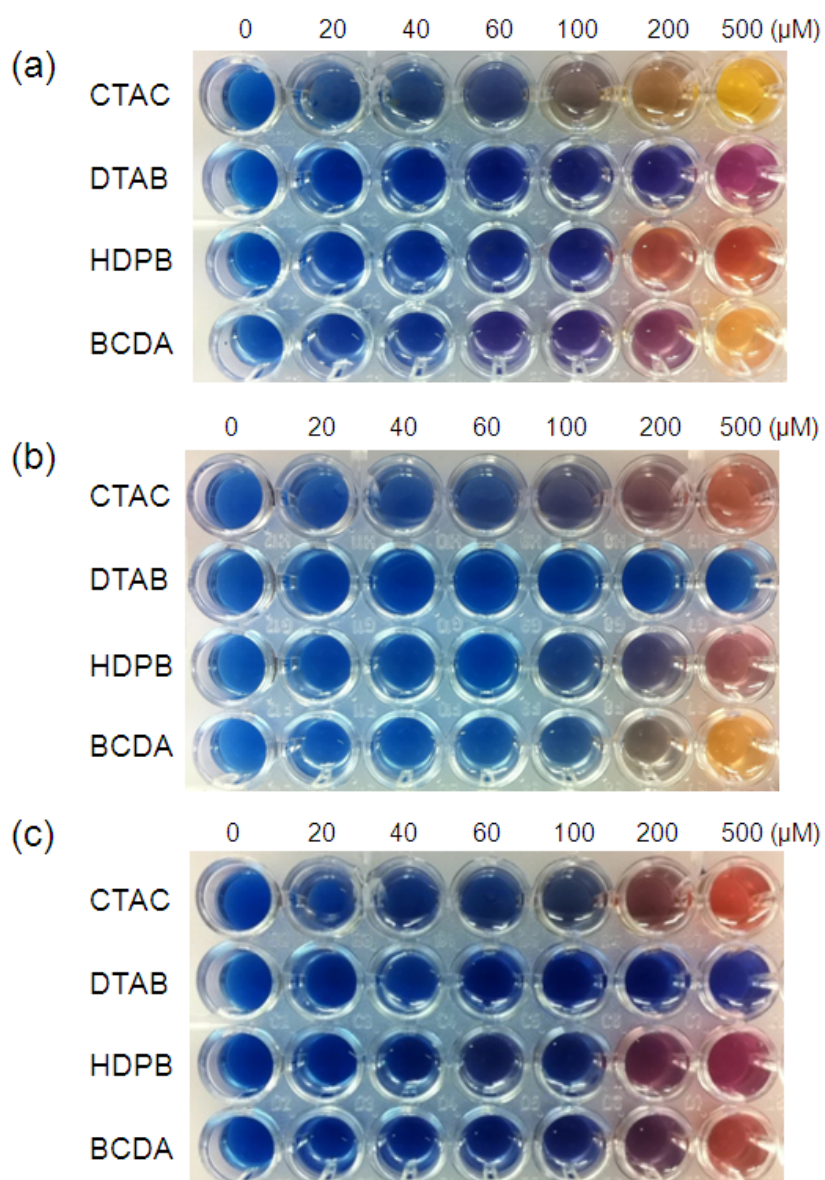
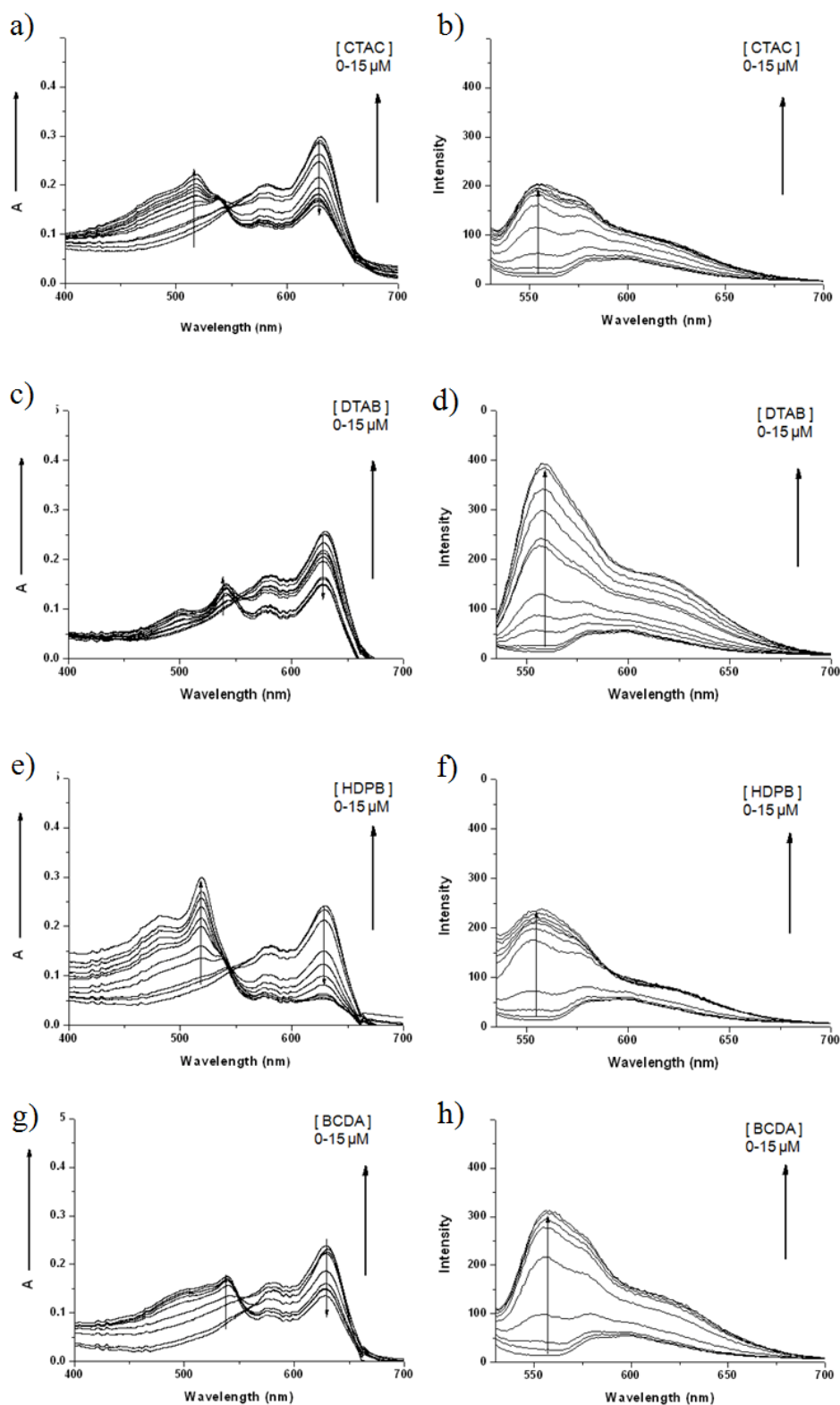


Fig. S6  $^{13}\text{C}$  NMR (62.5MHz) of compound PCDA-EBA in  $\text{CDCl}_3$

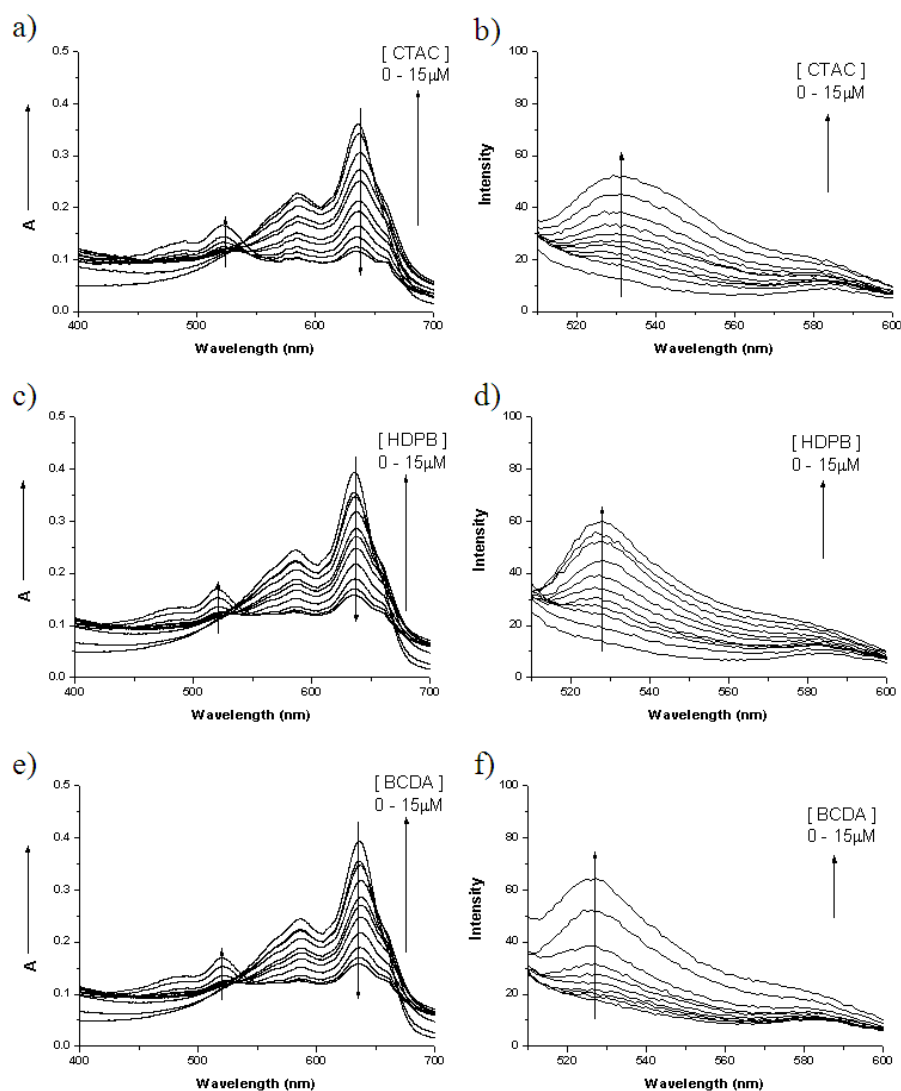


**Figure S7.** Colorimetric titration of Benzoic acid series ( 0.25 mM ) a) 4-(pentacosyl-10,12-dioxy)benzoic acid., b) 4-(pentacosyl-10,12-diamidobenzoyl)benzoic acid , c) 4-(2-(pentacosyl-10,12-diamidoethyl)benzoyl)benzoic acid with various amounts of cationic surfactants.



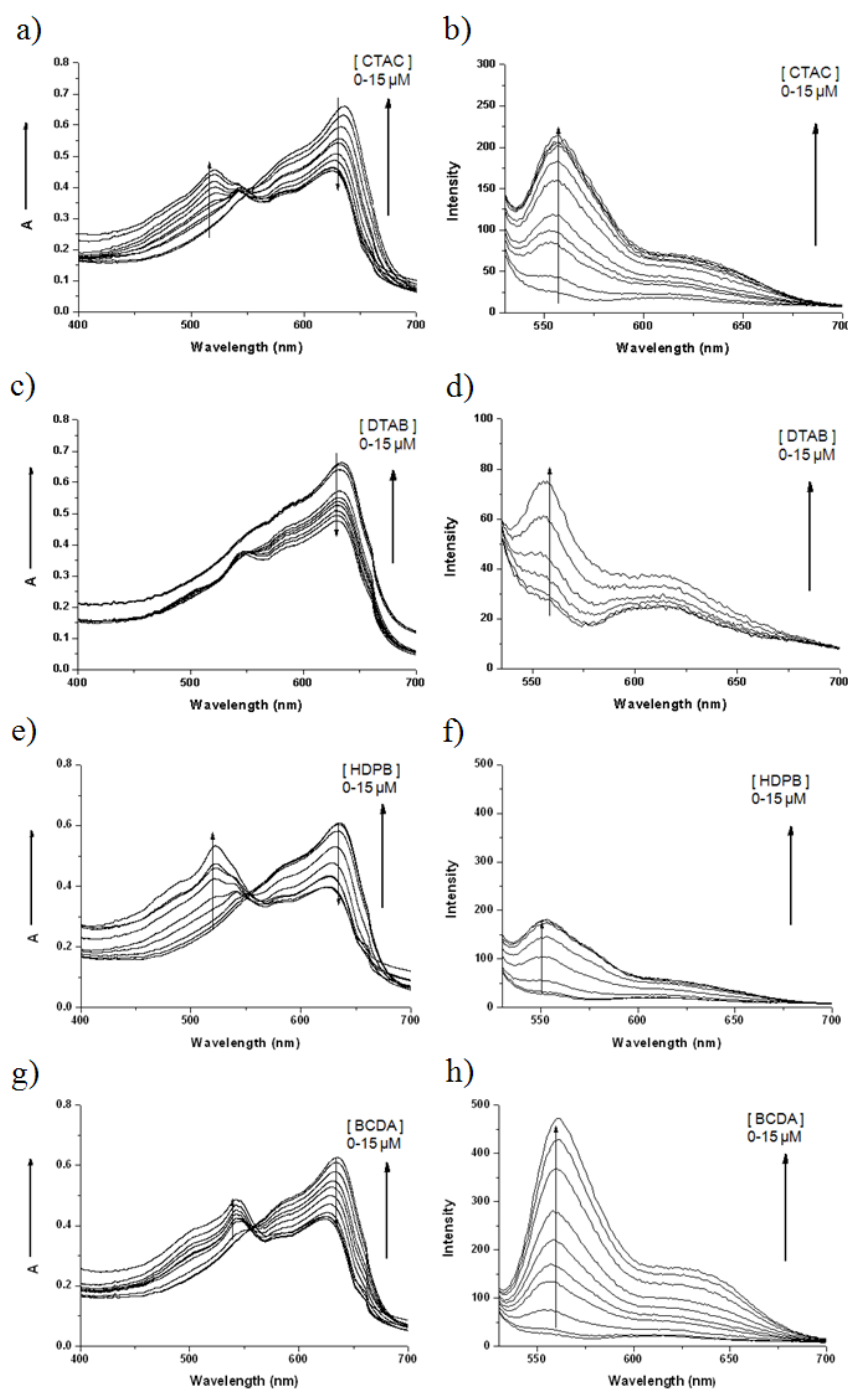
**Figure 8.** UV/Vis spectra and fluorescent response of 4-(pentacosyl-10,12-diyndyloxy)benzoic acid (**PCDA-HBA**, 100 $\mu$ M) liposome upon addition of various cationic surfactants : (a), (c), (e), (g) UV-Vis spectra of (**PCDA-HBA**) with 0 - 15  $\mu$ M CTAC, DTAB, HDPB or BCDA ; (b), (d), (f), (h) Fluorescent spectra of (**PCDA-HBA**) (0.02mM) with 0 - 15  $\mu$ M CTAC, DTAB, HDPB or BCDA. ( Excitation 510 nm, slit: 5nm/ 5nm).



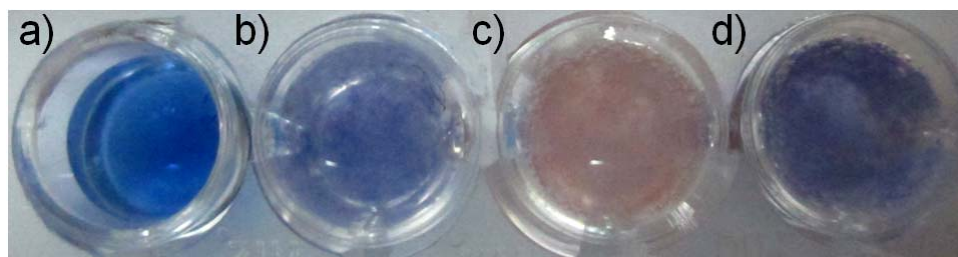


**Figure S9.** UV/Vis spectra and fluorescent response of 4-pentacosyl-10,12-diamidobenzoic acid (**PCDA-ABA**, 100 μM) liposome upon addition of various cationic surfactants : (a), (c), (e) UV-Vis spectra of (**PCDA-ABA**) with 0 - 15 μM CTAC, DTAB, HDPB or BCDA ; (b), (d), (f) Fluorescent spectra of (**PCDA-ABA**) (0.02 mM) with 0 - 15 μM CTAC, DTAB, HDPB or BCDA. ( Excitation 510 nm, slit: 5nm/ 5nm).

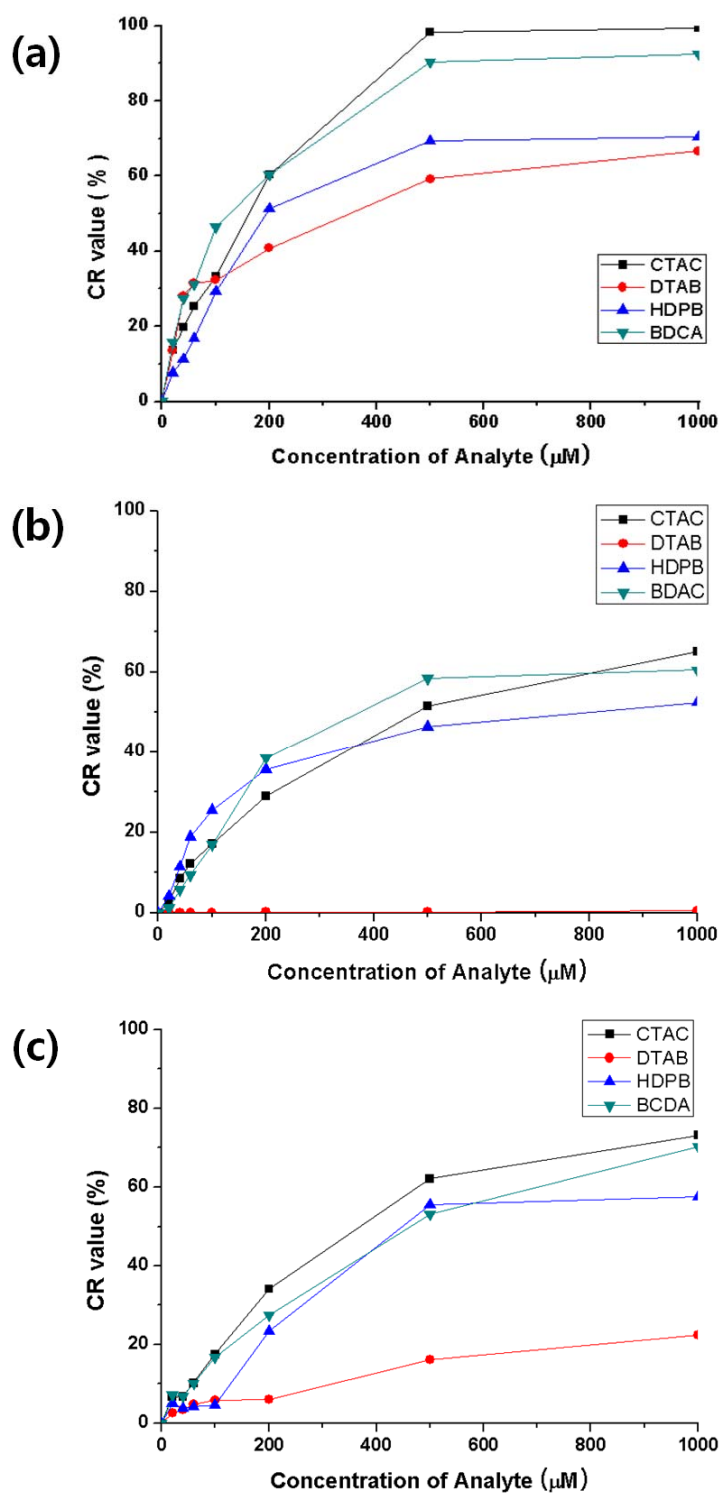




**Figure S10.** UV/Vis spectra and fluorescent response of 4-(2-pentacosyl-10,12-diyndamidoethyl)benzoic acid (**PCDA-EBA**, 100μM) liposome upon addition of various cationic surfactants : (a), (c), (e), (g) UV-Vis spectra of (**PCDA-EBA**) with 0 - 15 μM CTAC, DTAB, HDPB or BCDA ; (b), (d), (f), (h) Fluorescent spectra of (**PCDA-EBA**) (0.02mM) with 0 - 15 μM CTAC, DTAB, HDPB or BCDA. ( Excitation 510 nm, slit: 5nm/ 5nm).



**Figure S11.** Colorimetric change of PCDA-HBA toward commercial detergents ; a) blank b) shampoo (Kearsys, Askyung Ltd); c) rinse (Kearsys, Askyung Ltd); d) hair treatment (Pantene, Procter & Gamble Ltd)



**Figure S12.** Colorimetric response ( %CR ) of liposome solution toward various cationic - surfactants. a) PCDA-HBA ; b) PCDA-ABA ; c) PCDA-EBA.