Supporting Information

Small molecule-mediated self-assembly behaviors of Pluronic block copolymers in aqueous solution: Impact of hydrogen bonding on morphological transition of Pluronic micelle

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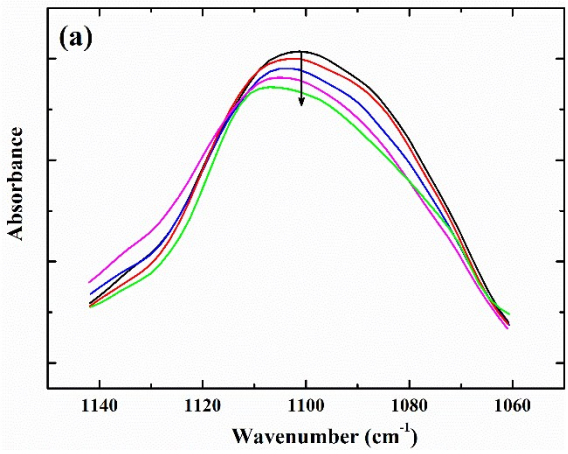
FTIR measurements and results

FT-IR experiments were conducted to investigate the hydrogen bonding interaction between small molecules and P123 copolymer and the result of which is shown Fig. S1. A typical FTIR spectrum of Pluronic block copolymer in the absence and presence of small molecules are displayed in the range of 1140-1060 cm^{-1}, which represents the stretching vibrations band of C-O-C of P123. As shown in Fig. S1(a), the wavenumber of C-O bands of Pluronic P123 experiences a shift toward higher frequency with increasing concentration of PB. This indicates that the addition of PB (without hydroxyl) interrupts the hydrogen bonding of ether oxygen atoms with H_2O, resulting in the dehydration the P123 copolymer.[1] In contrast, the wavenumber of C-O bands of Pluronic P123 shifts to lower frequency with varying degree upon addition of PP and PG (with varying number of hydroxyl). It has been reported that when Pluronic copolymer forms hydrogen-bonding with water, the electron cloud density of ether oxygen atom (C-O-C) of Pluronic copolymer decreases, resulting in the shift toward to the lower frequency of spectra band in FTIR.[2] Therefore, it is evident that hydrogen-bonding are formed between P123 and PP or PG. In addition, it has been reported that the phenolic hydroxyl can form hydrogen bonding with ether group of PEO. [3-5]



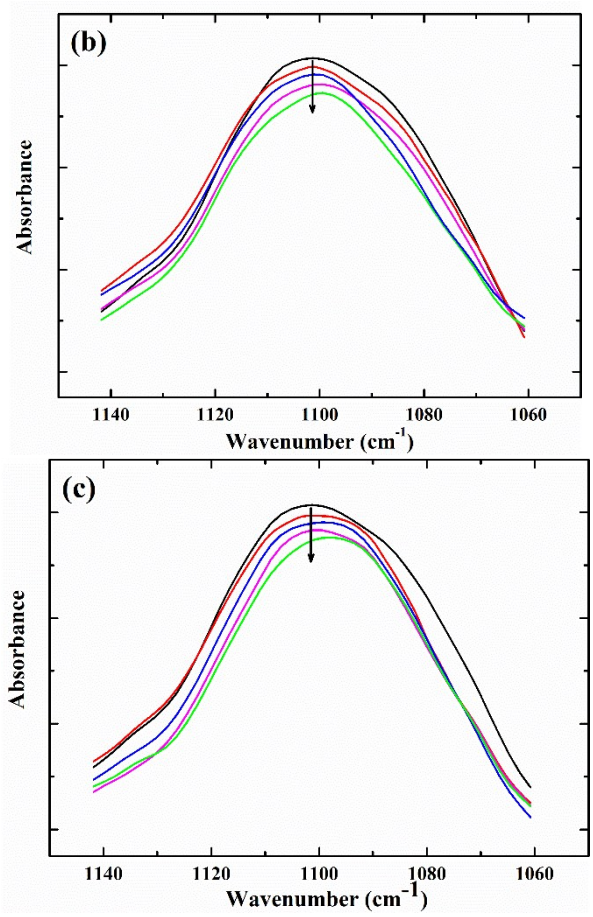


Figure S1 FTIR spectra of 5.0% P123 in the absence and presence of different concentration of PB (a), PP (b) and PG (c) in aqueous solutions. Concentration of small molecules are 0 mM (black line), 10 mM (red line), 20 mM (blue line), 30 mM (magenta line) and 40 mM (green line) respectively.

Reference

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