Electronic Supplementary Material (ESI) for Polymer Chemistry.


**Supporting Information**

# Core-shell Microgels Having Zwitterionic Hydrogel Core and Temperature-responsive Shell Prepared via Inverse Miniemulsion RAFT Polymerization

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## Methods

### Fluorescence microscopy

Phase contrast and fluorescence image of W/O emulsion were observed using BX51 (Olympus Corp., Tokyo, Japan).

### Scanning electron microscopy (SEM)

The morphology of PMPC core–shell microgels was observed by SEM, using JSM-6700F (JEOL Ltd., Tokyo, Japan) at an accelerating voltage of 5.0 kV. The diluted dispersion of PMPC core–shell microgels was deposited on a silicon wafer and dried under an ambient pressure condition. Then, a layer of platinum was deposited on the dried PMPC core–shell microgels using JFC-1500 sputter coater (JEOL Ltd, Tokyo, Japan). The SEM image-based diameter of PMPC core–shell microgels was obtained using Image J software.

### Transmission electron microscopy (TEM)

TEM observation of PMPC core–shell microgels was conducted using JEM-1400 (JEOL Ltd., Tokyo, Japan) at an accelerating voltage of 100 kV. To prepare samples for TEM observations, diluted dispersion of PMPC core–shell microgels was placed on carbon-coated grids and dried by lyophilization.

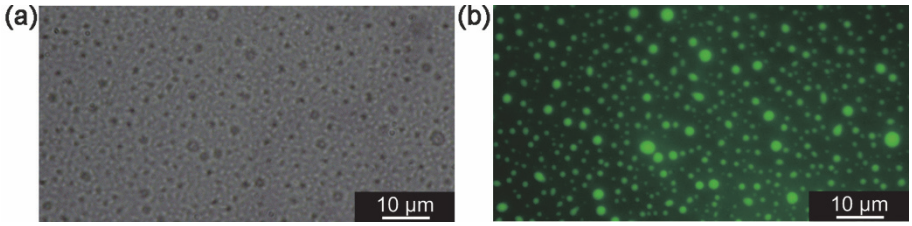


**Figure S1.** Phase contrast (a) and fluorescence images (b) of the W/O emulsions after sonication for 3 min. The W/O emulsions were prepared using an aqueous fluorescein solution (0.2 mg/mL) as a water dispersed phase in the presence of P(OEGMA-*co*-$MEO_2MA$)-*b*-PMPC (100 mg/mL relative to the dispersed phase). The fluorescence of the fluorescein in the interior portion of droplets indicates the formation of W/O emulsions.

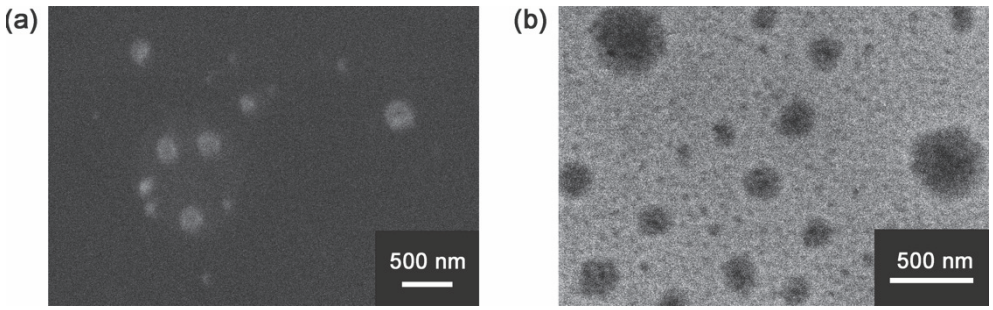


**Fig. S2.** SEM (a) and TEM (b) images of PMPC core–shell microgels.

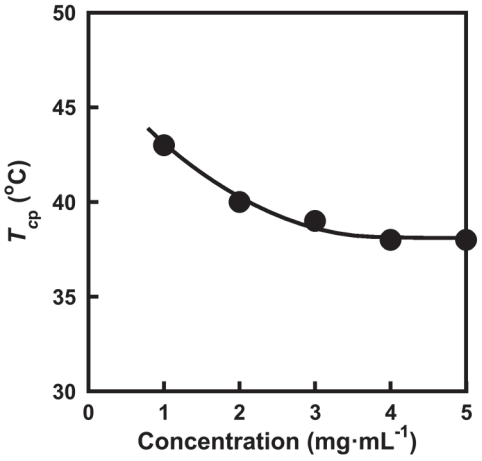


**Fig. S3.** Relationship between cloud point temperature ($T_{cp}$) and concentration of P(OEGMA-*co*-$MEO_2MA$)-*b*-PMPC. $T_{cp}$ was determined as the temperature exhibiting 50% transmittance of aqueous P(OEGMA-*co*-$MEO_2MA$)-*b*-PMPC solutions.

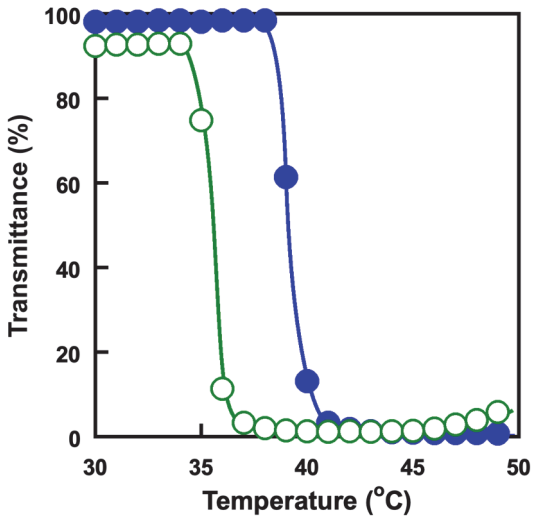


**Fig. S4.** Changes in transmittance (650 nm) of a PMPC core–shell microgel dispersion in water (●) and phosphate buffered saline (○) as a function of temperature.