Electronic Supplementary Material (ESI) for New Journal of Chemistry
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Electronic Supplementary Information (ESI)

Facile preparation of highly monodisperse poly(NIPAAm)/AuNPs composite hollow microcpsules by simple tubular microfluidics

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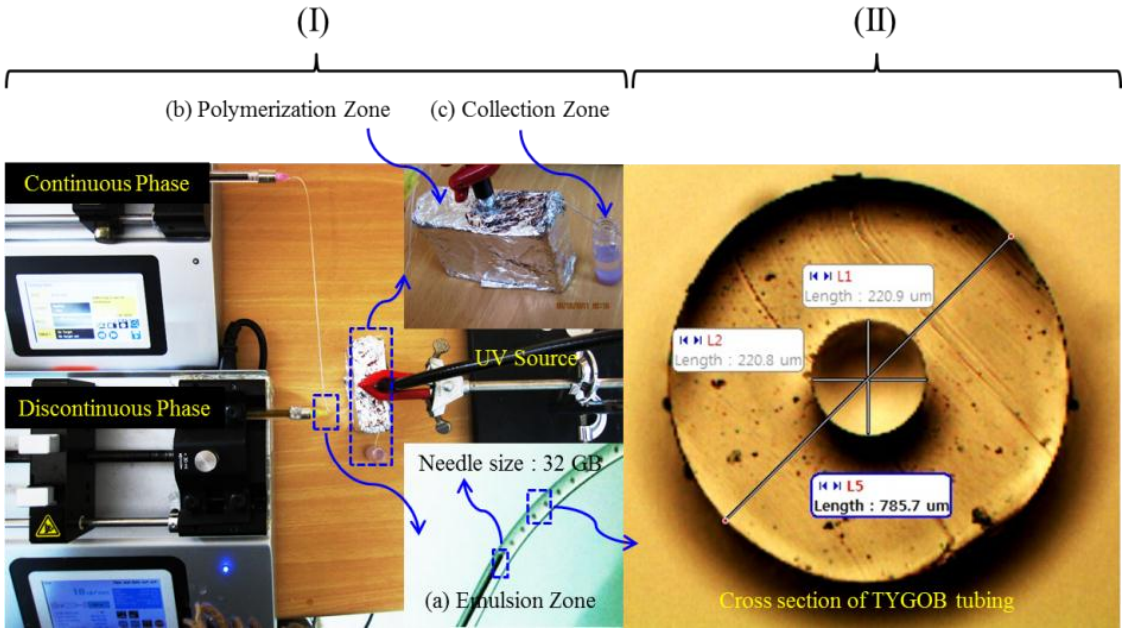

(ESI-1) Experimental setup of tubular microfluidic device: (I) digital photographs of the emulsification, polymerization and collection zones of the device and (II) optical microscopic cross section of TYGON tubing, showing the dimensions of the tubing.

Depending upon the shell thickness of poly(NIPAAm)/AuNPs composite hollow microspheres, the particles with different structures behave differently when dispersed in water due to the degree of flux (osmosis) shown by the particles with the surrounding medium. The particles which show breathing characteristic on dispersing in water show rapid and large wavy like temporary deformations and within few minutes regain their original stretched shape (ESI-2, a-c). When the particles with buckled morphology are dispersed in water, the degree of shape deformation is less as compared to breathed particles and the particles doesn`t retain their original shape exactly (ESI-2, d-f). However, the particles with breathed state of morphology when dispersed in water do not show any signs of extra deformations and remains in a steady state for hours (ESI-2, g-i). These studies confirms the fact that poly(NIPAAm/AuNPs) microspheres which show creasing structure have walls thick enough to resist any exchange of

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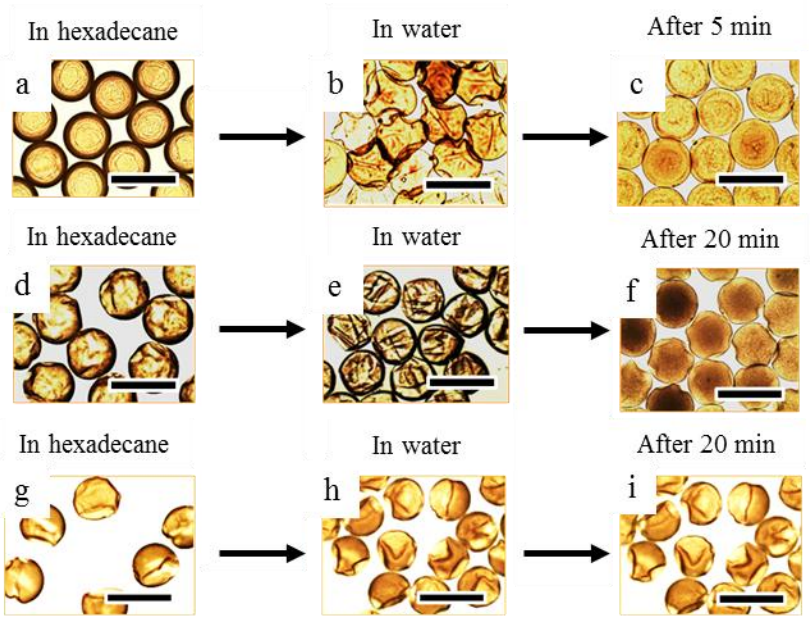
material with the surroundings. As the shell thickness decreases (as mentioned in the manuscript), while moving from creasing to buckling and from buckling to breathing, the poly(NIPAAm/AuNPs) microspheres undergo extra temporary deformations under the action of rapid osmotic shock.



(ESI-2) Effect of degree of osmosis on the morphological changes in the PNIPAAm/AuNPs microcapsules on dissolving them in water, (scale bar, 135 μm).