

Supporting Information for:

Polymer Patchy Colloids with Sticky Patches

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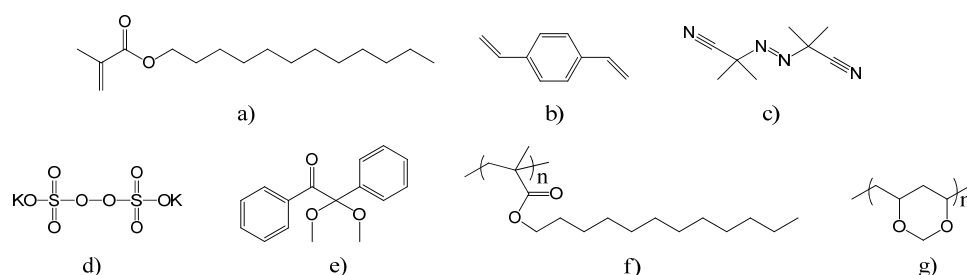


Fig. S1 Chemical structures of the monomers, initiators, and polymers mentioned in this study: **a)** dodecyl methacrylate (DMA); **b)** 1,4-divinylbenzene (DVB); **c)** azobisisobutyronitrile (AIBN); **d)** potassium persulfate (KPS); **e)** 2,2-dimethoxy-2-phenylacetophenone (DMPA); **f)** poly(dodecyl methacrylate) (PDMA); **g)** poly(vinyl formal) (PVF).

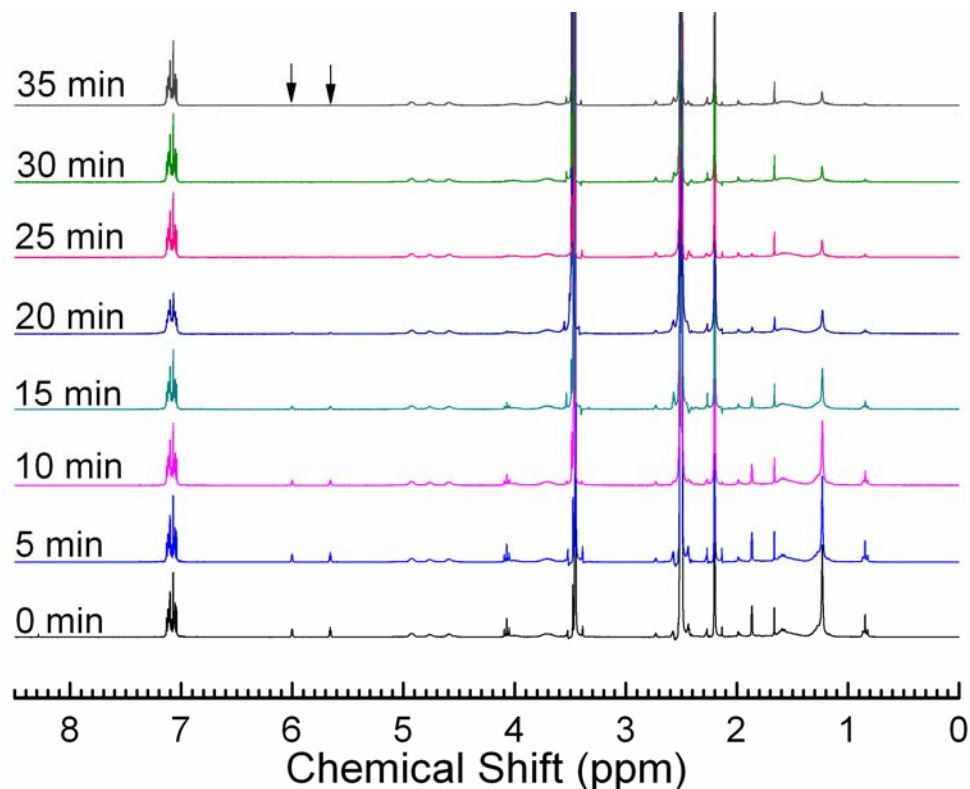


Fig. S2 ^1H NMR spectra of the dispersion (Entry 7 in Table 1) diluted in $\text{DMSO-}d_6$ after polymerizing at different times. Xylene (7.02~7.16 ppm) was used as the external standard while the arrows showing the integral of protons near carbon-carbon double bond (6.0 ppm and 5.66 ppm) in DMA decreased with reaction time.

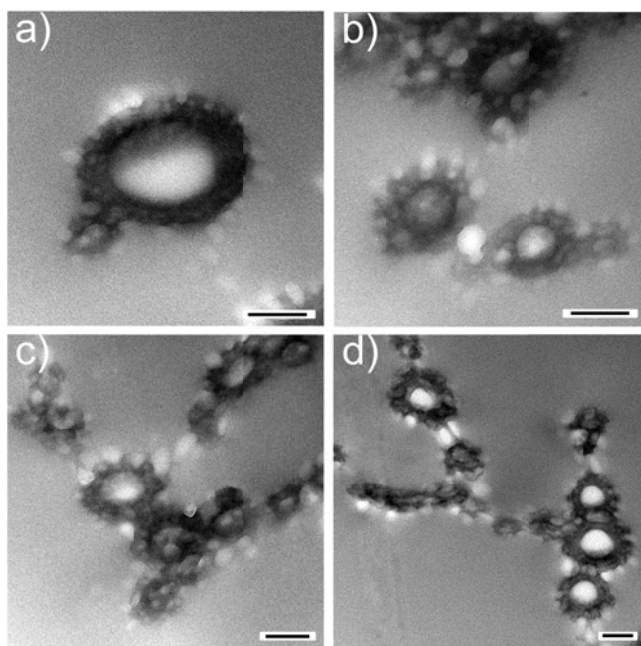


Fig. S3 Cross-section TEM micrographs for PPs (Entry 1 of Table 1) showing the core-shell structure of PPs and two distinct phases on the particles surface. The scale bars represent 200 nm.

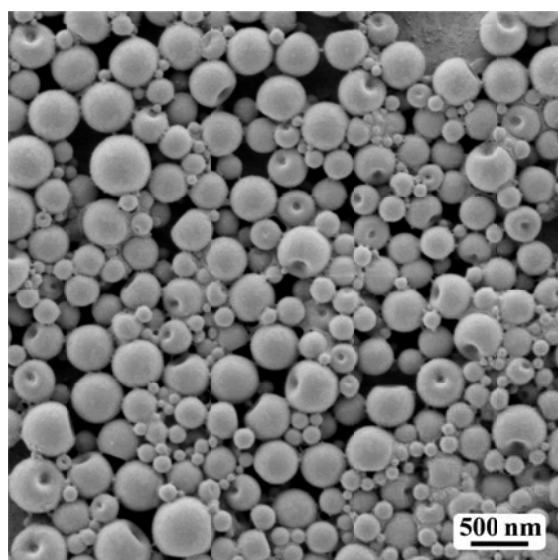


Fig. S4 SEM micrograph of the obtained PVF/PDMA nanoparticles showed that there was no multiple patches on particle surface when the photo-induced polymerization was carried out at room temperature.

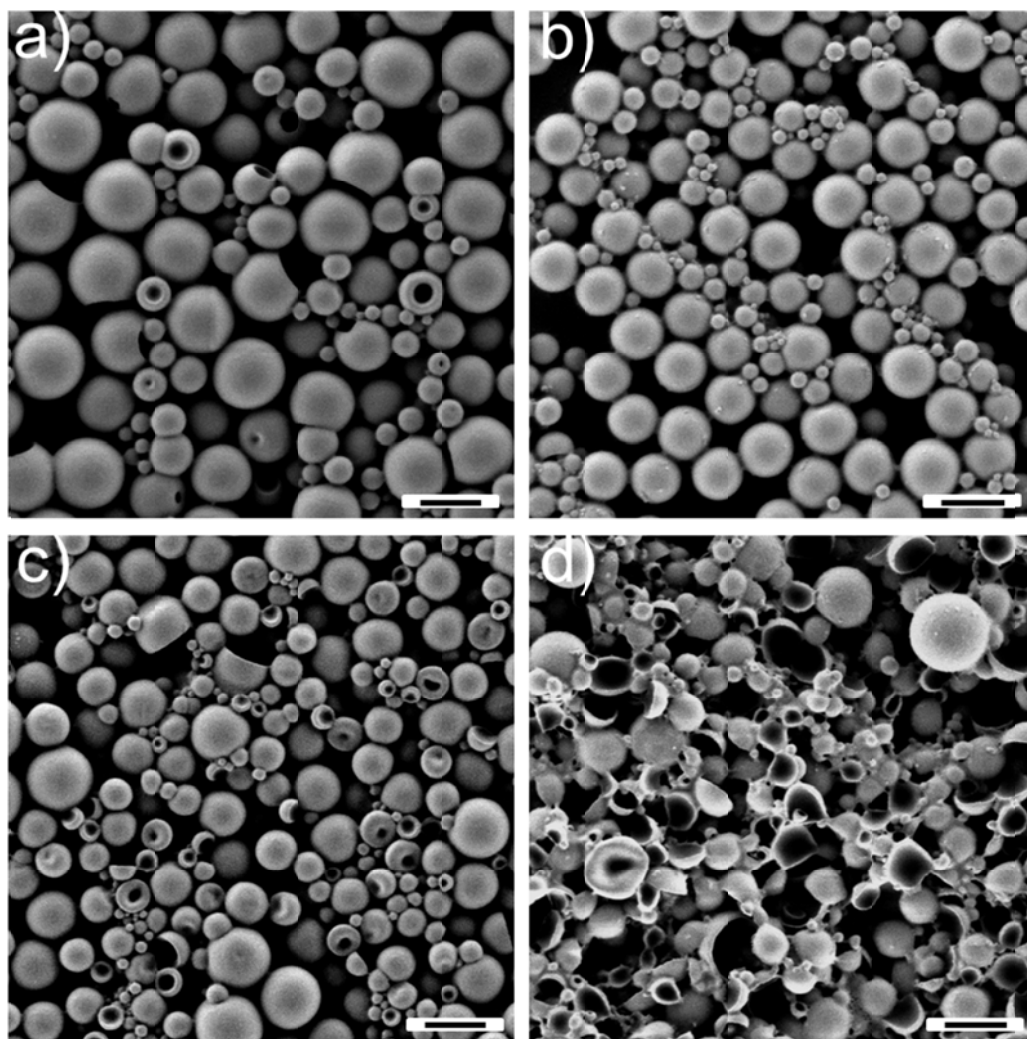


Fig. S5 SEM micrographs of PVF nanoparticles with different DMA contents (wt.% compared to the total amount of monomers) before polymerization: **a)** 10% (Entry 5 in Table 1); **b)** 20% (Entry 6 in Table 1); **c)** 40% (Entry 7 in Table 1); **d)** 60% (Entry 8 in Table 1). The scale bars represent 500 nm.

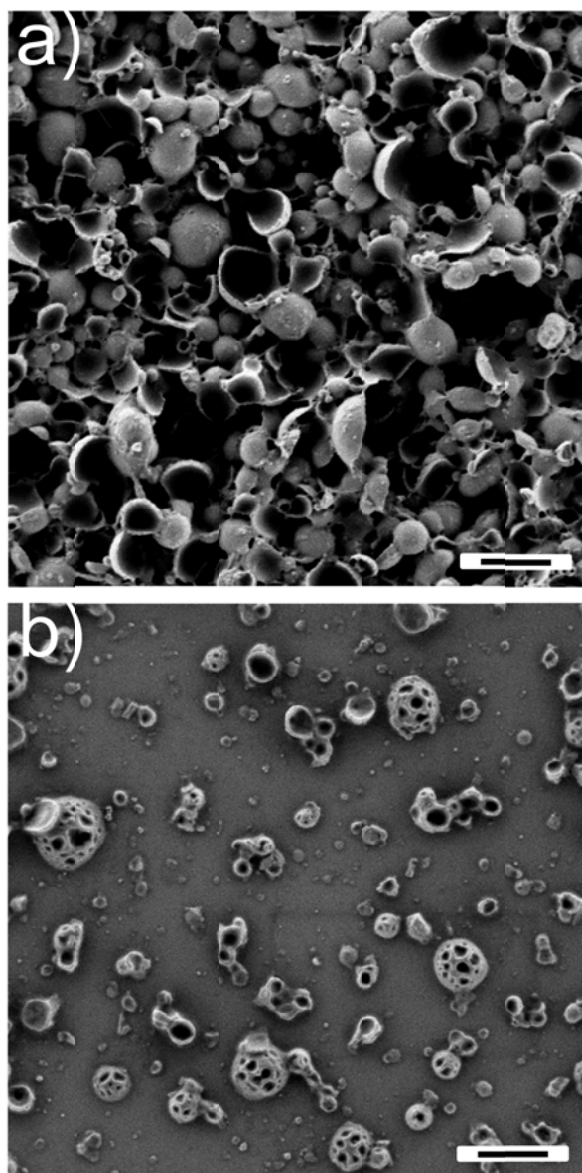


Fig. S6 SEM micrographs of PVF nanoparticles (Entry 9 in Table 1) prepared with a DMA content (wt.% compared to the total amount of monomers) of 80% **a)** before, and **b)** after polymerization. The scale bars represent 500 nm.

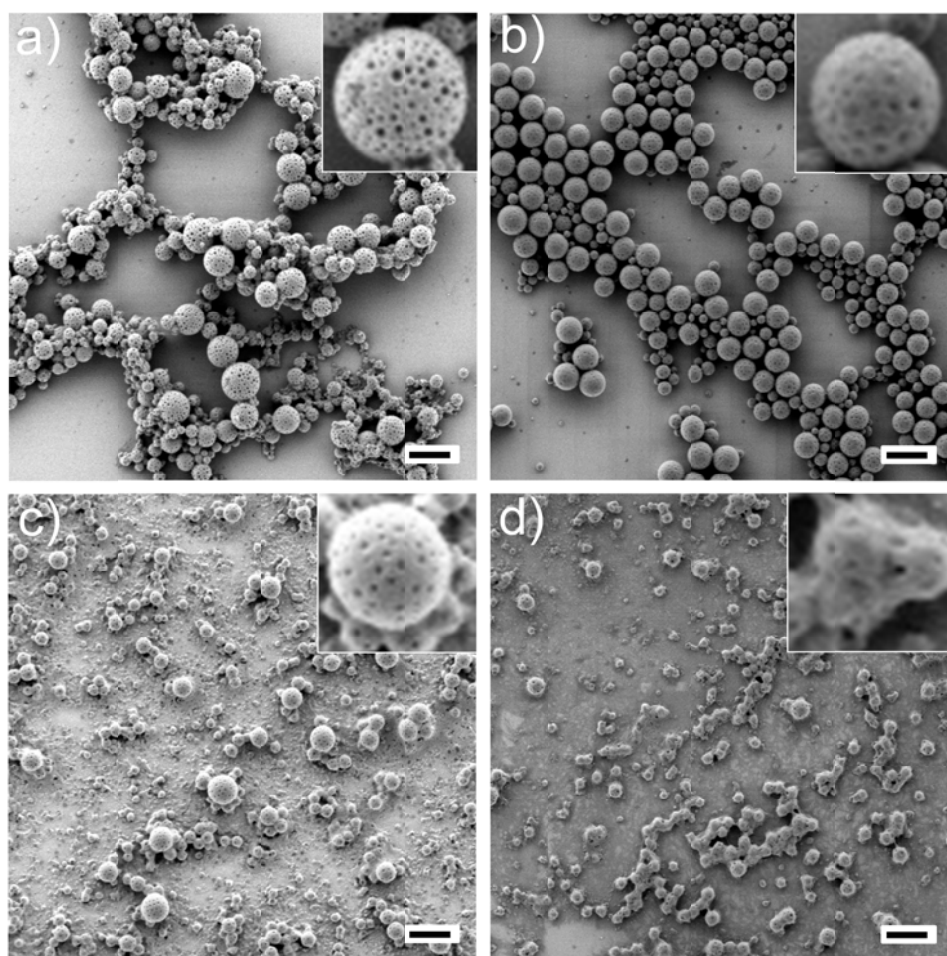


Fig. S7 SEM micrographs of PPs (Entry 6 of Table 1) annealed at 90 °C in water for different times: **a)** 0 h; **b)** 1 h; **c)** 2 h; **d)** 3h. The scale bars represent 500 nm.

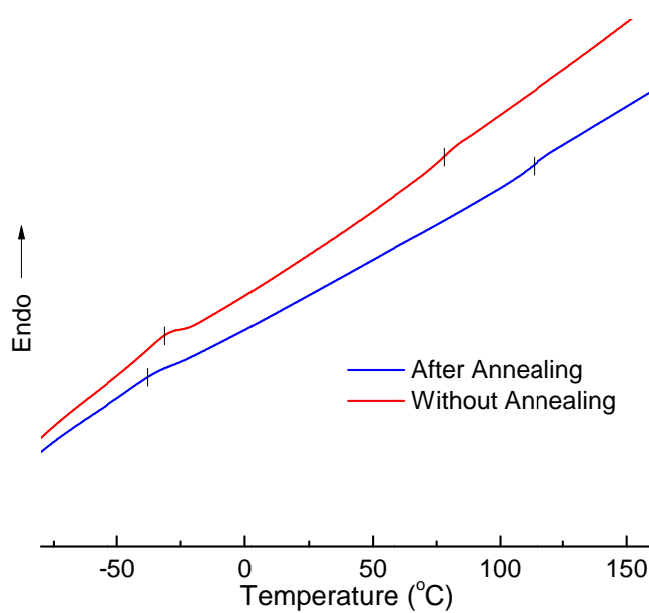


Fig. S8 DSC curves of PPs powder (Entry 1 in Table 1) before annealing and after annealing at 120 °C for 24 h.

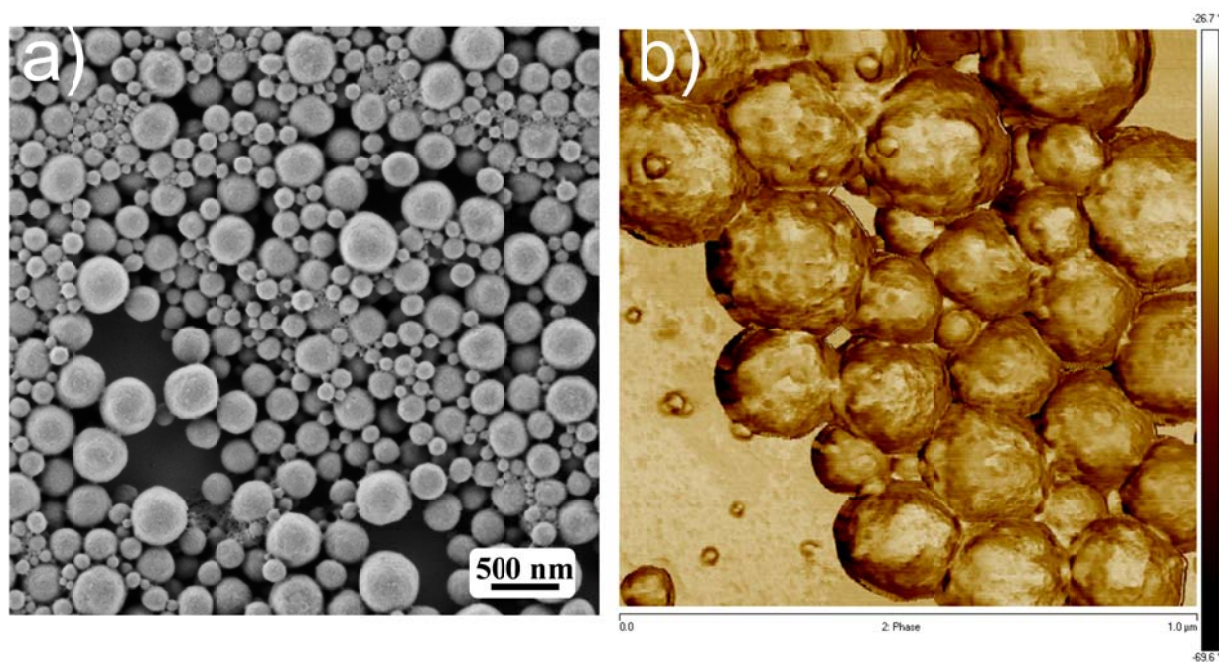


Fig. S9 **a)** SEM micrographs and **b)** AFM phase image of the crosslinked PPs (Entry 10 of Table 1, 15 wt.% DVB). The patchy domains could not be easily identified from the phase image when the initial amount of DVB was 15 wt.%.