

Supporting Information

Impressed Pressure-Facilitated Seeded Emulsion Polymerization: Design the Fast Swelling Strategies for Massive Fabrication of Patchy Microparticles

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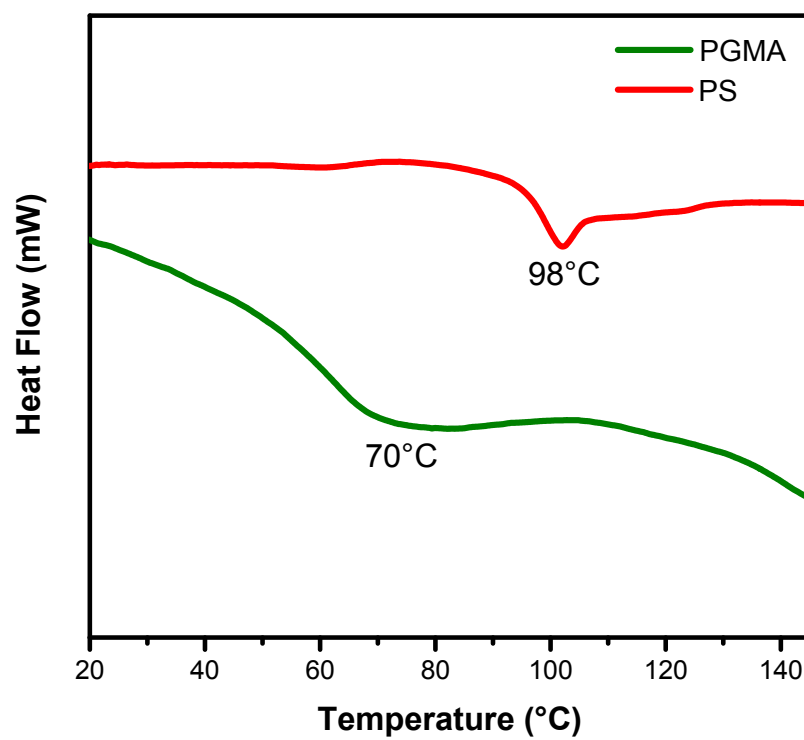


Fig. S1 DSC traces of pure PGMA and PS particles prepared by dispersion polymerization.



Fig. S2 Large-scale preparation of irregular microparticles by ultrasound swelling for 10 min with the ratio of DBP/S was 1.5/1.5.

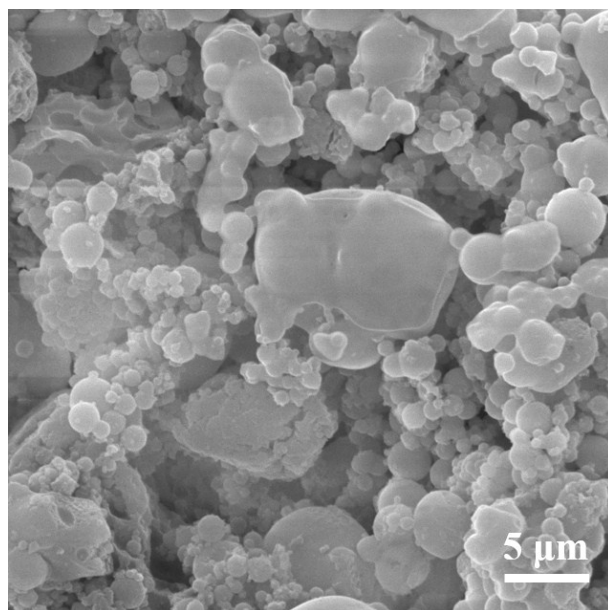


Fig. S3 SEM image of the microparticles prepared by PS seed particles.

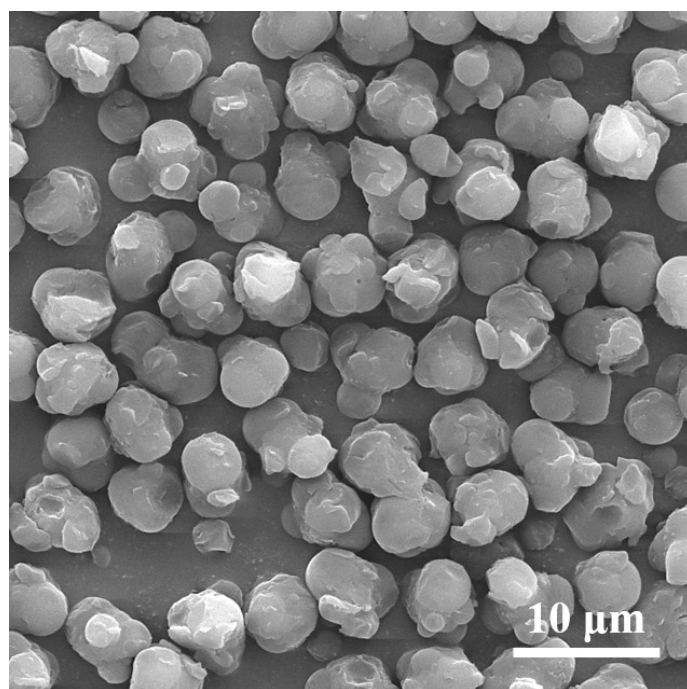


Fig. S4 SEM image of patchy microparticles prepared with DBP/S=2.5/2.5.

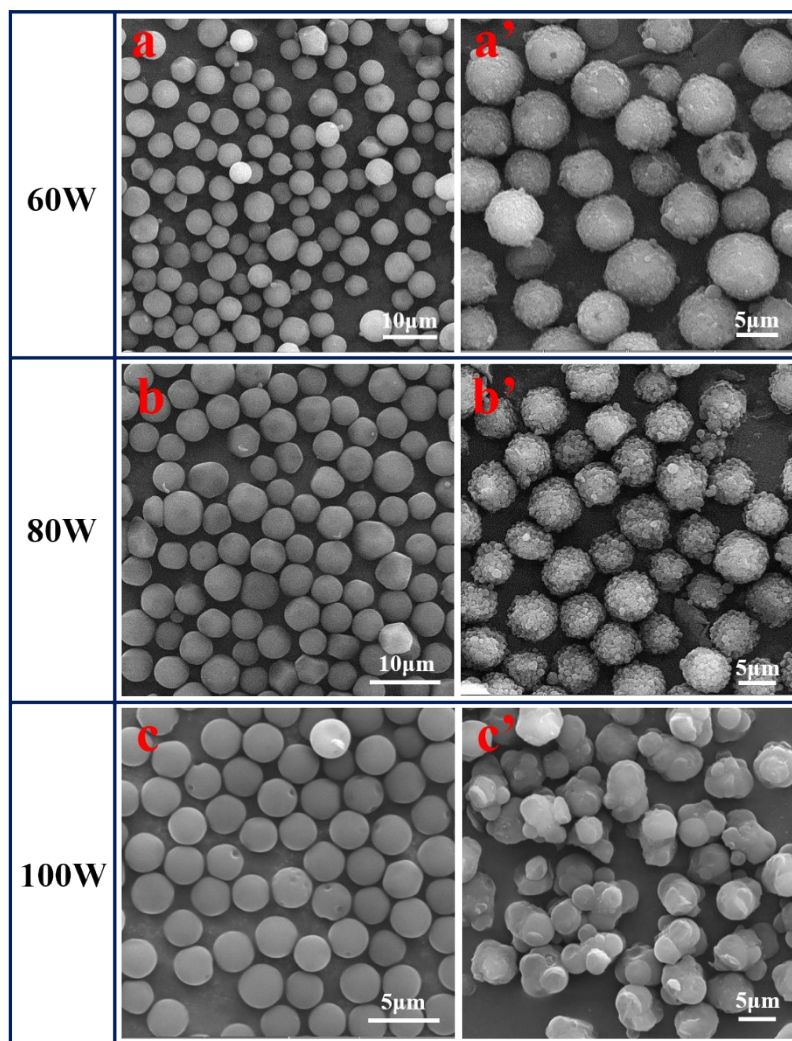
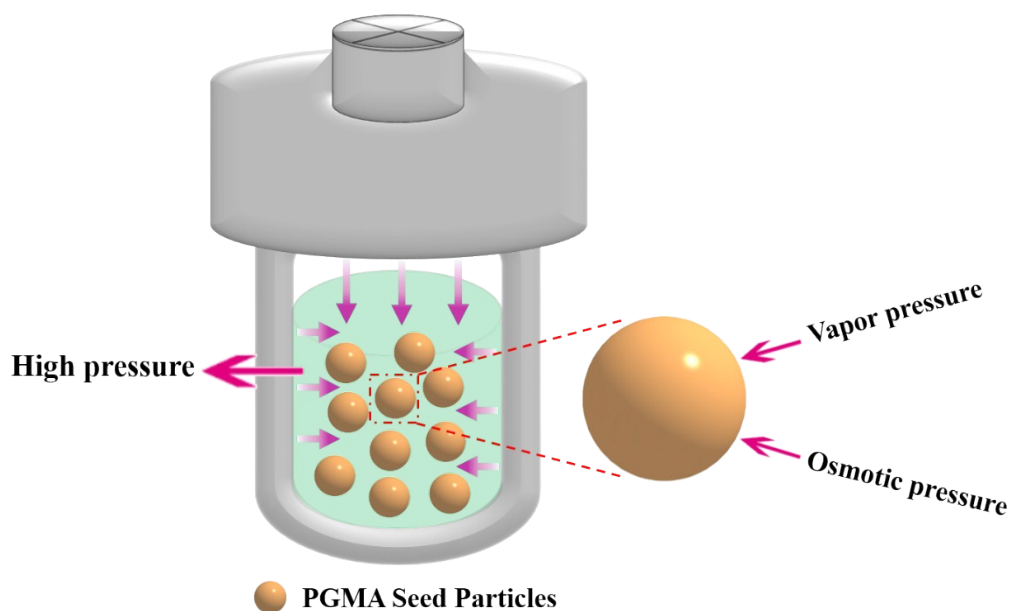


Fig. S5 SEM images of swollen PGMA particles by ultrasound swelling at different power.

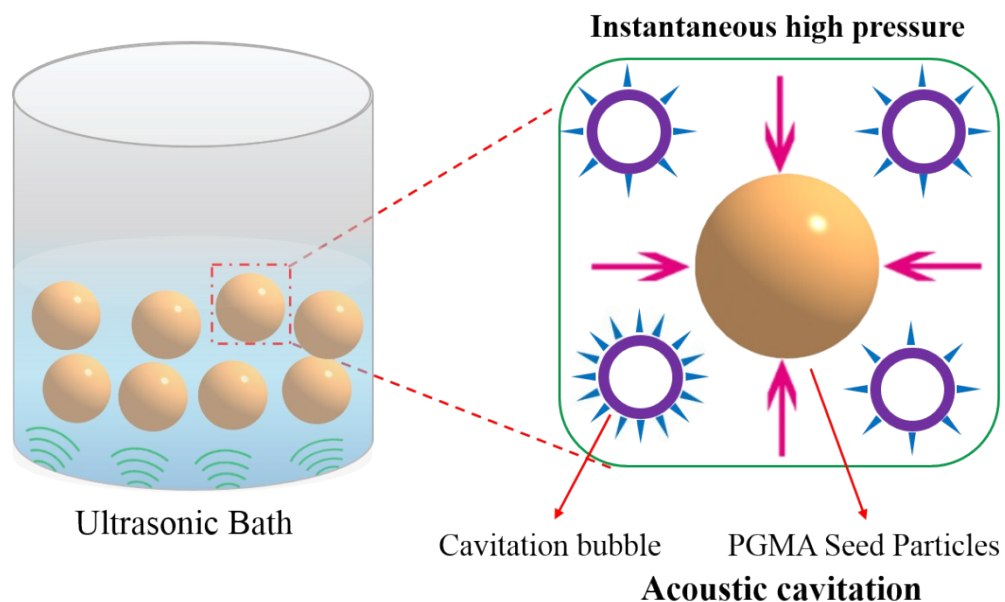
Swelling mechanism

(1) High-pressure swelling. Considering the swelling process driven by osmotic pressure difference, we create an external pressure to facilitate the swelling of monomer. Therefore, when the autoclave is heated, a vapor pressure will be created, as shown in Scheme S1. The vapor pressure increases the osmotic pressure difference, and accelerates the swelling process. When monomer swells into seed particles, phase separation will occur because of the compatibility of monomer and seed polymer. In a short swelling time, phase separation is not completed, and two holes are formed on the surface (Fig 3a'). However, when the swelling time is 3 h, single hole is appeared (Fig 3c').



Scheme. S1 The formation mechanism of high-pressure swelling.

(2) Ultrasound swelling. The idea is similar to the high-pressure swelling. We create the external pressure by acoustic cavitation. In the process of ultrasound, abundant cavitation bubbles are formed. When the cavitation bubble collapse, it will cause instantaneous high pressure to facilitate the swelling of monomer (Scheme. S2).



Scheme. S2 The formation mechanism of ultrasound swelling.