Electronic Supplementary Material (ESI) for Soft Matter.

Supporting Information

New Insight into Icing and De-Icing Properties of Hydrophobic and Hydrophilic Structured Surfaces Based on Core-Shell Particles

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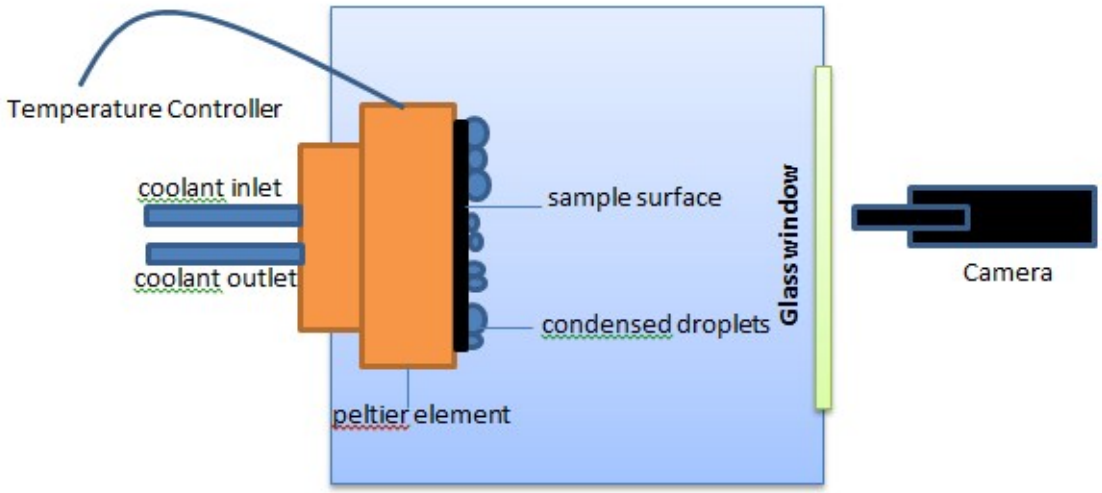

Figure S1. Schematic of a temperature and humidity controlled chamber for the icing and deicing tests

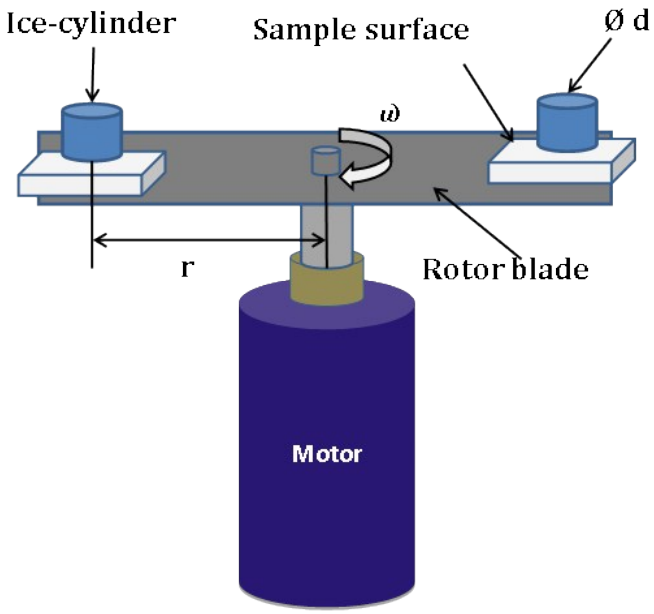

Figure S2. Schematic of an experimental setup for the ice-adhesion strength measurements

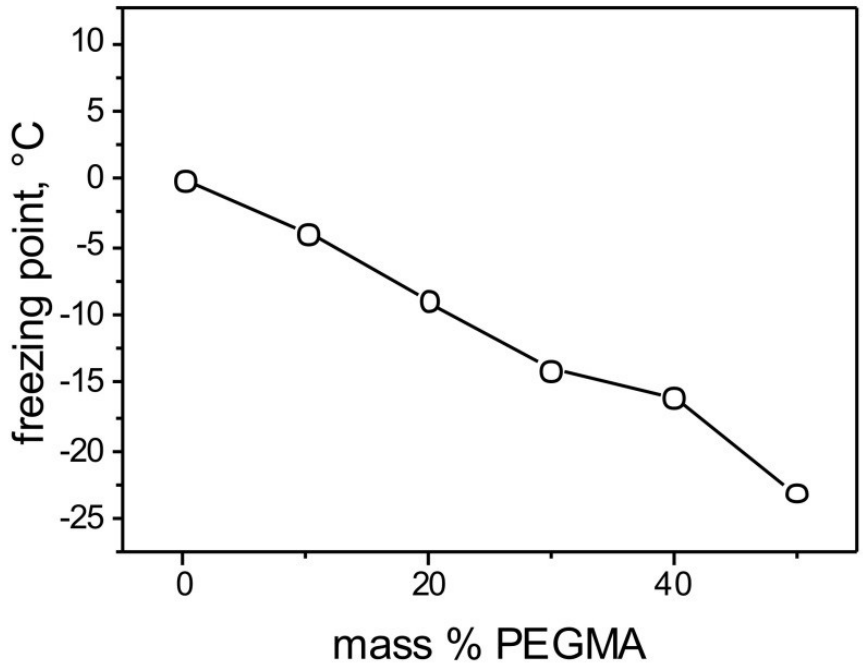

Figure S3. Freezing point of P(PEGMA)-water mixtures.

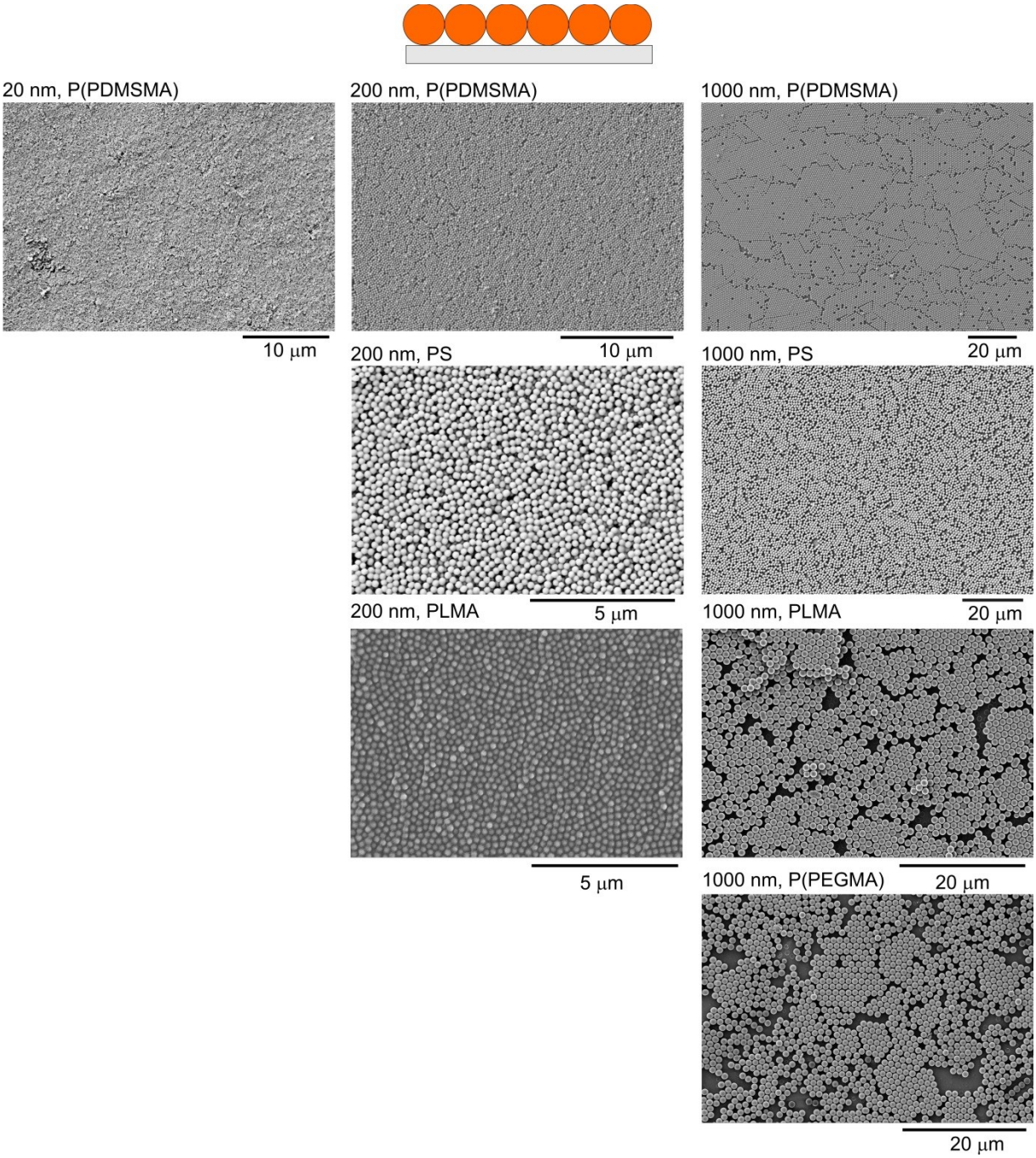

Figure S4. Representative SEM images of layers based on spherical core-shell particles (diameter 20 nm, 200 nm and 1000 nm) with PS, PLMA, P(PDMSMA) and P(PEGMA) shells.

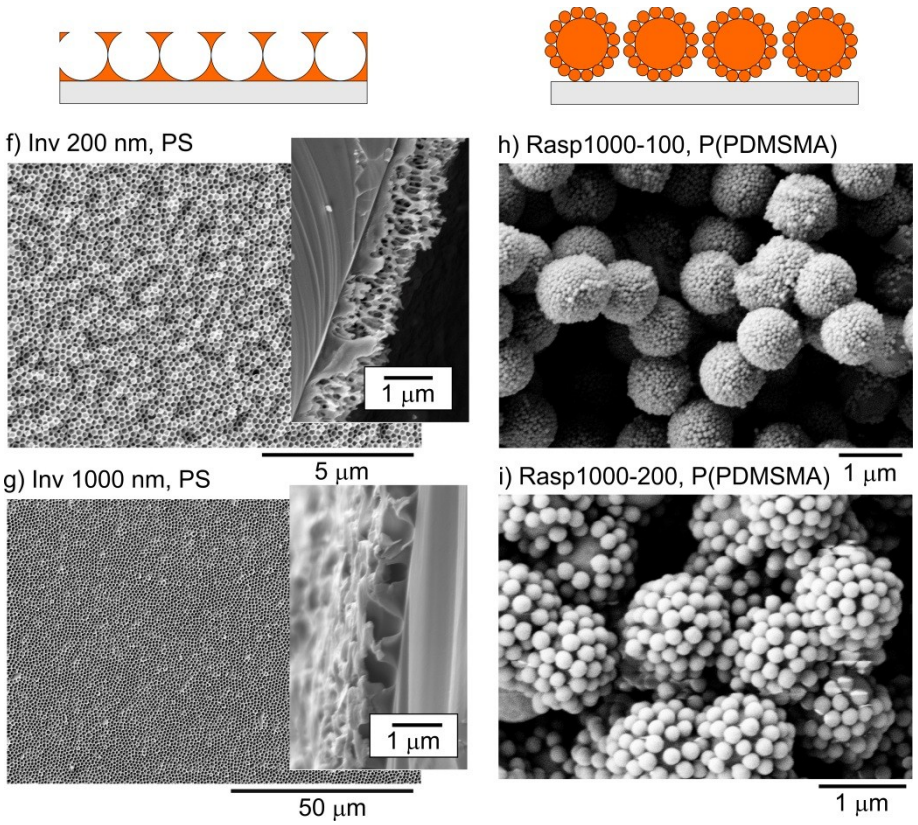

Figure S5. Representative SEM images of inverse structures (PS) prepared by etching of colloidal particles from the polymer matrix, and raspberry core-shell particles with a P(PDMSMA) shell.

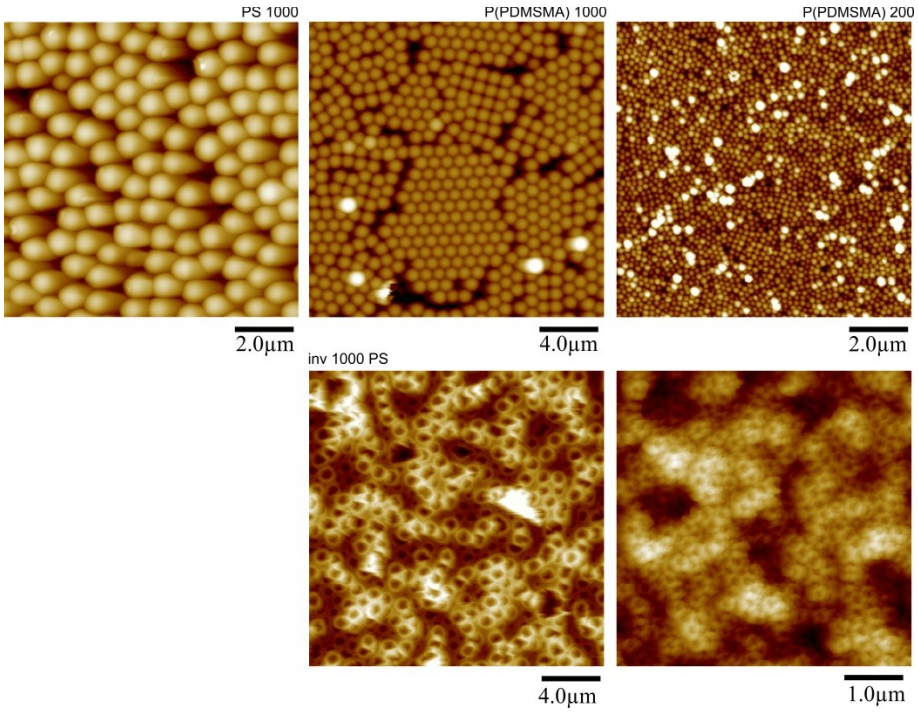

Figure S6. Representative AFM images of different rough and inverse structured surfaces

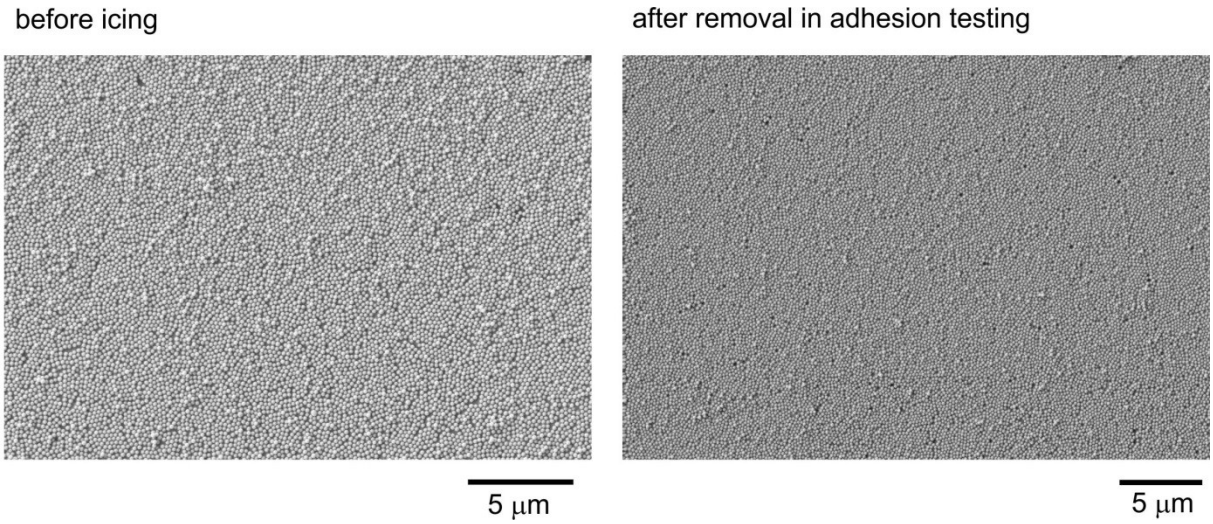

Figure S7. Representative SEM images of a surface with 200 nm large particles before ice adhesion measurements and after ice removal in adhesion tests (proof of robustness)

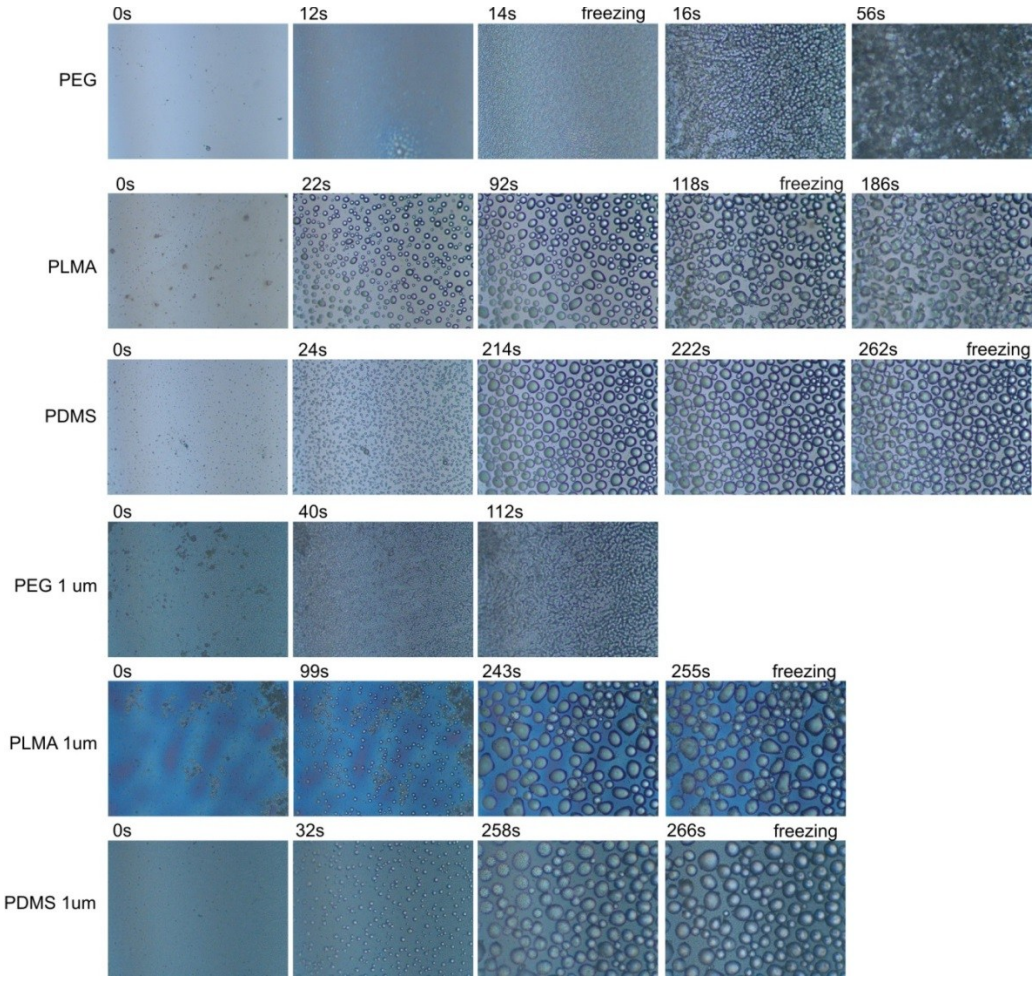

Figure S8. Optical microscopy images of water droplet condensation and their freezing on different polymeric surfaces

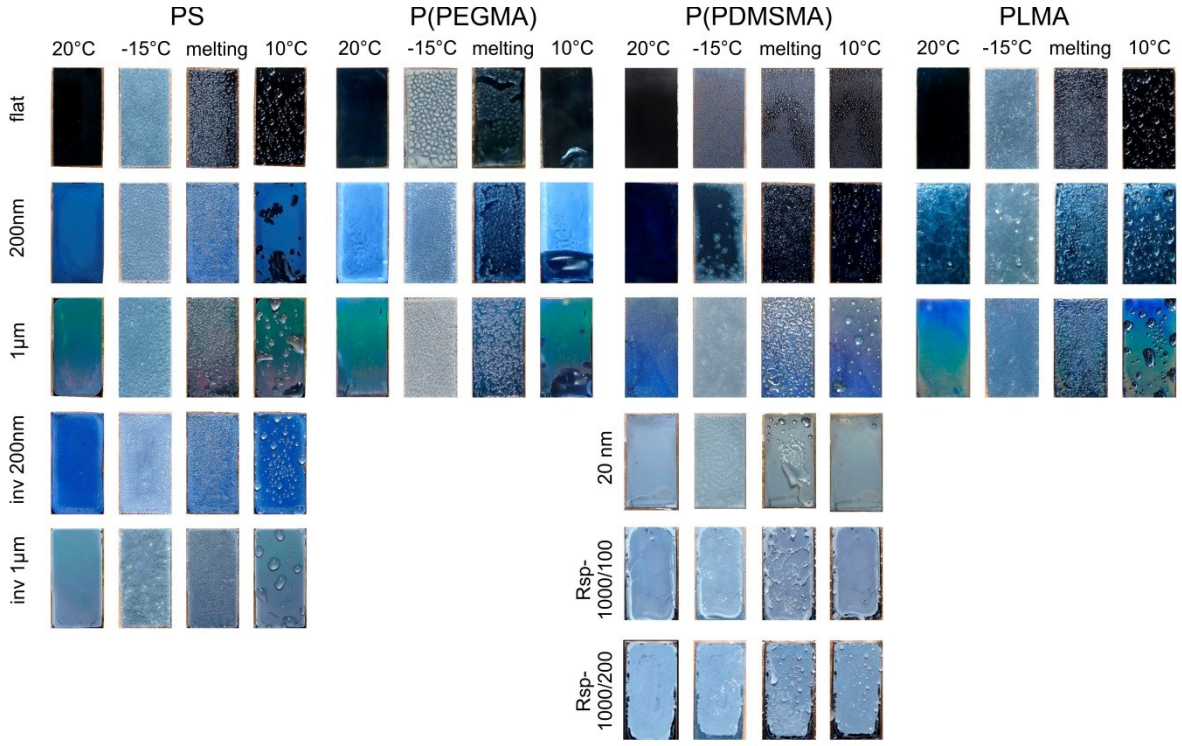

Figure S9. Photo images of PS, P(PEGMA), P(PDMSMA) and PLMA flat and rough surfaces during freezing (down to -15°C) and thawing (4°C).

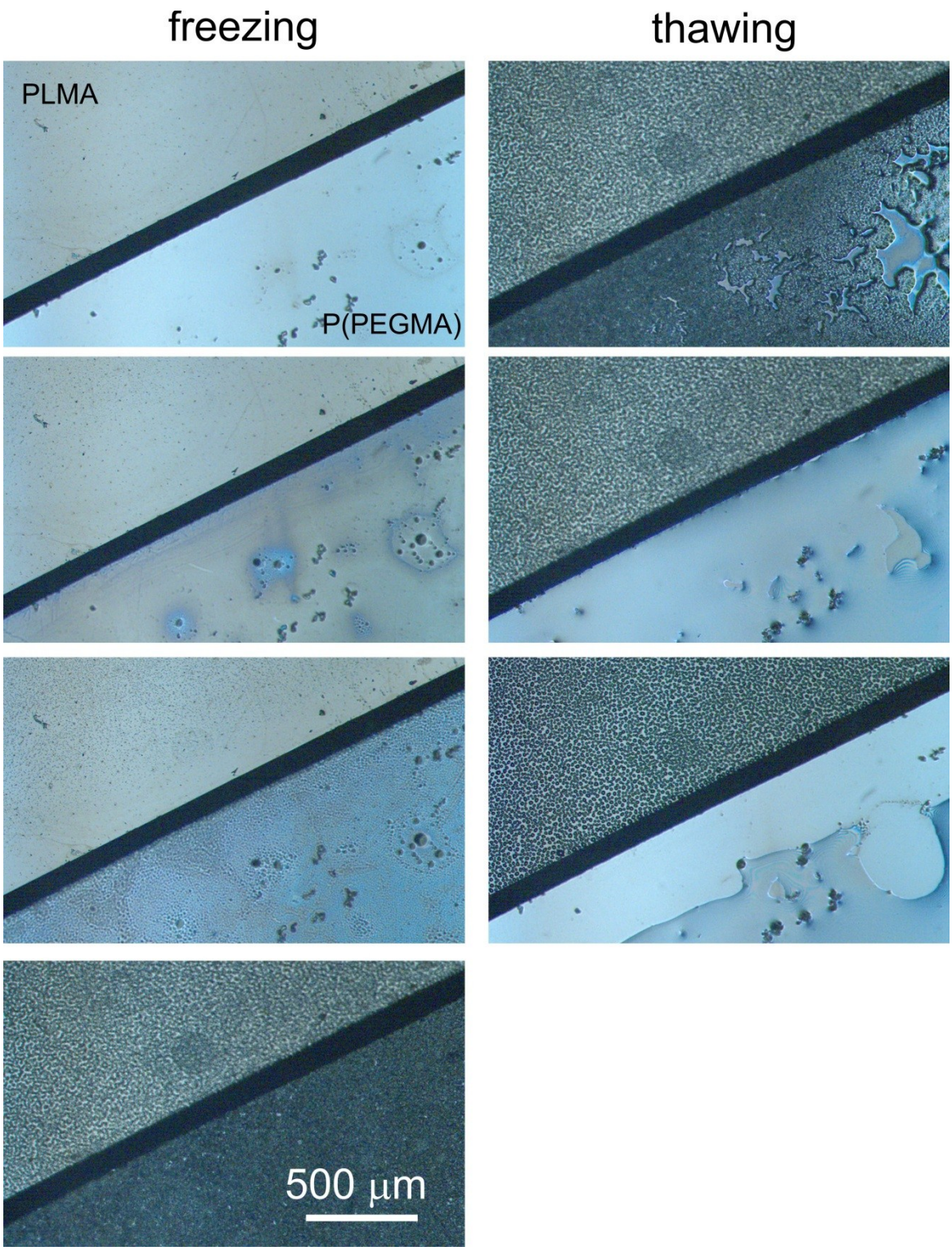

Figure S10. Comparative freezing and thawing of PLMA and P(PEGMA) flat surfaces (optical microscopy images)

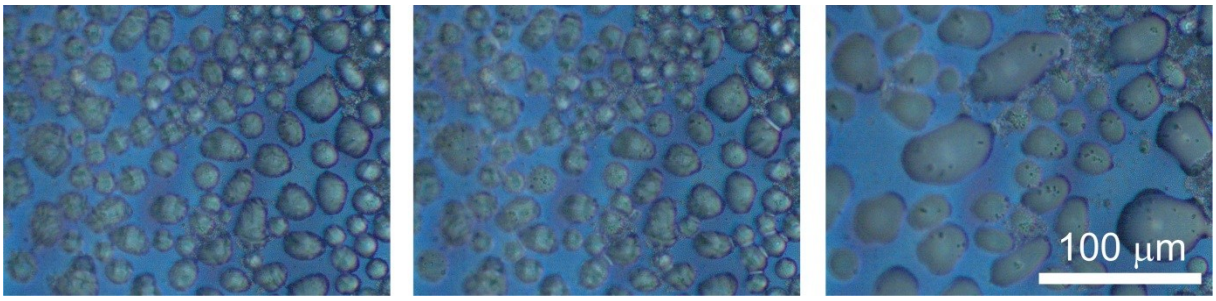

Figure S11. Thawing of ice on a surface with 1 µm large PLMA particles.

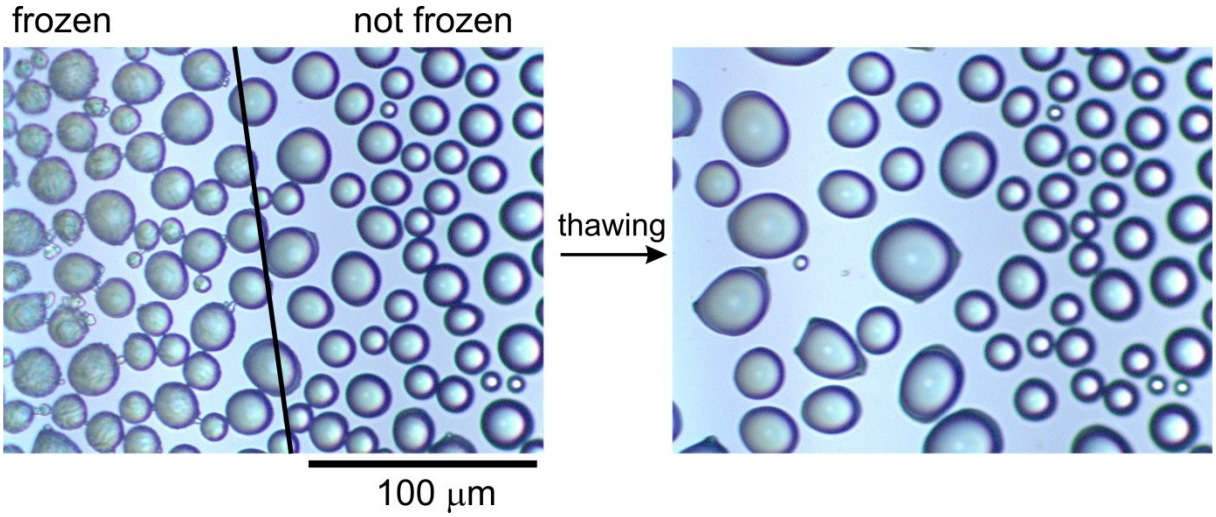

Figure S12. Thawing of ice on a flat PS surface (optical microscopy images)

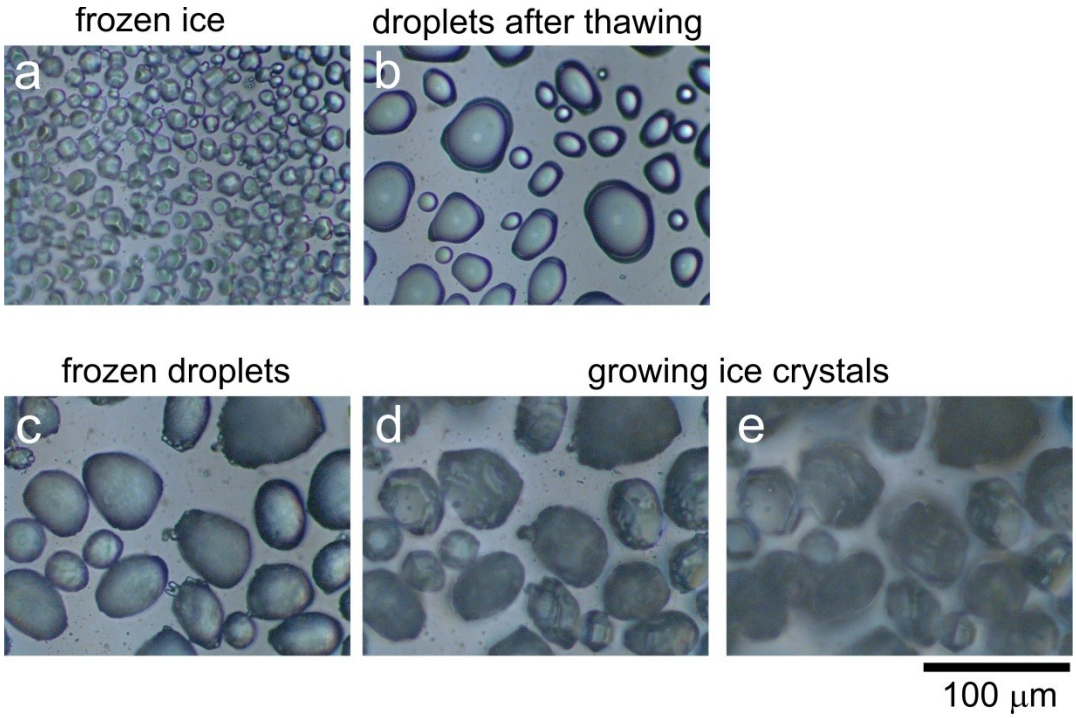

Figure S13. Thawing of ice crystals on a PLMA surface and re-freezing of the formed droplets (optical microscopy images)