

## Preparation of microcapsules with nanostructured membranes using microphase separation of block-copolymers

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Microphase separations of block copolymers have been widely studied in soft matter physics and materials chemistry due to unique morphologies, which depend on their composition, segment-segment interaction parameters, and degree of polymerization. Recently, there are a few reports on phase separation of block copolymers in cylindrical and spherical confining geometries. In this study, we report the microphase separation within the thin membrane in spherical symmetry for the artificial polymeric vesicles. For this, double emulsion droplets were employed, of which shell phase contains blends of symmetric poly(styrene)-block-poly(butadiene)-block-poly(styrene) (PS-*b*-PB-*b*-PS) and polystyrene homopolymer (hPS). We found various microphases in the spherical membrane, which depended on the fraction of PS chain in the polymer blends. As the fraction increased, we observed the phase transition from perforated lamellae to cylinders and spheres.