

Abstract Submitted
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Self-assembly of polystyrene-*b*-poly(4-vinylpyridine) and polystyrene-*b*-poly(ethylene oxide) in small molecules melt¹ CHENG-HAO YU, YU-HAO CHUANG, SHIH-HUANG TUNG, Institute of Polymer Science and Engineering, National Taiwan University, Taipei 10617, Taiwan, SOFT NANOMATERIALS GROUP TEAM — It is well known that amphiphilic block copolymers in selective solvents self-assemble into micellar structures, where solvophilic blocks tend to contact with solvents while solvophobic blocks are shielded from the solvents. Different from the conventional micellization in liquid systems, we report that block copolymer poly(styrene-*b*-4-vinylpyridine) (PS-*b*-P4VP) and poly(styrene-*b*-ethylene oxide) (PS-*b*-PEO) can self-assemble in melted small molecules at high temperature and the structures can be retained in “solid state” after being cooled down to room temperature. Transmission electron microscopy (TEM) was used to probe the structures and we found that a series of self-assembled structures, including spherical micelles, wormlike micelles and vesicles can be obtained by varying the length of block copolymers and the morphologies are dependent on annealing temperature and time. Since these nano-structures can be retained in solid state, we also demonstrate to extract the nano-structures by removing small molecules using appropriate solvents. These extracted structures, especially the vesicles, which are loaded with solid molecules, are potential applications of nanocapsules and controlled release

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