Abstract Submitted
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Self-assembly of ultrahigh molecular weight comb block copolymer at the air/water interface[1] LEI ZHAO, MATTHEW GOODMAN, NED BOWDEN, ZHIQUN LIN, FUNCTIONAL POLYMERIC NANOCOMPOSITES TEAM, THE BOWDEN TEAM — Self-assembly of a newly synthesized, amphiphilic comb block copolymer (CBCP) at the air/water interface was systematically explored using the Langmuir Blodgett (LB) technique. The CBCP had an ultra high molecular weight (MW = 510 x 10^3 g/mol) with polystyrene arms grafted along one block of long hydrophilic backbone. At the air/water interface, the CBCP molecules spontaneously assembled into ribbon-like structures and cellular patterns at the zero surface pressure when volatile solvent (i.e., chloroform) and less volatile solvent (i.e., toluene) were used, respectively. This spontaneous self-assembly behavior of CBCP was induced by the dewetting process. The mechanism for the morphological change as a function of surface pressure was scrutinized and further confirmed by the compression-expansion cycle and solvent vapor annealing studies. To the best of our knowledge, this is the *first study* of self-assembly of ultrahigh MW, amphiphilic CBCP at the air/water interface. As such, it provides insight into the design of controllable pattern formation using amphiphilic copolymers.

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