

Abstract Submitted
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Micellar Packing in Aqueous Solutions of As-Received and Pure Pluronic Block Copolymers¹ CHANG RYU, HAN JIN PARK, Rensselaer Polytechnic Institute — Pluronic block copolymers (Pluronics) are produced on a commercial scale to enable wide range of novel applications from emulsification and colloidal stabilization as nonionic surfactants. While the Pluronic block copolymers offer the advantages of being readily available for such applications, it contains non-micellizable low molecular weight (MW) impurities that would interfere with the self-assembly and micellar packing of PEO-PPO-PEO triblock copolymers in aqueous solutions. The impacts of the low MW impurities will be discussed on the micellar packing of Pluronics F108 and F127 solutions, which form BCC and FCC. While as-received Pluronic samples typically contain about 20 wt.% low MW impurities, we were able to reduce the impurity level to less than 2 wt.% using our large scale purification technique. Comparative studies on small angle x-ray scattering (SAXS) experiments on as-received and purified Pluronics solutions revealed that the contents of triblock copolymers in solutions essentially governs the intermicellar distance of Pluronic cubic structures. A universal relationship between triblock copolymer concentration and SAXS-based domain spacing has been finally discussed.

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