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Anomalous Micellization of Pluronic Block Copolymers AMANDA LEONARDI, CHANG Y. RYU, Rensselaer Polytechnic Institute — Poly(ethylene oxide) – poly(propylene oxide) – poly(ethylene oxide) (PEO-PPO-PEO) block copolymers, commercially known as Pluronics, are a unique family of amphiphilic triblock polymers, which self-assemble into micelles in aqueous solution. These copolymers have shown promise in therapeutic, biomedical, cosmetic, and nanotech applications. As-received samples of Pluronics contain low molecular weight impurities (introduced during the manufacturing and processing), that are ignored in most applications. It has been observed, however, that in semi-dilute aqueous solutions, at concentrations above 1 wt%, the temperature dependent micellization behavior of the Pluronics is altered. Anomalous behavior includes a shift of the critical micellization temperature and formation of large aggregates at intermediate temperatures before stable sized micelles form. We attribute this behavior to the low molecular weight impurities that are inherent to the Pluronics which interfere with the micellization process. Through the use of Dynamic Light Scattering and HPLC, we compared the anomalous behavior of different Pluronics of different impurity levels to their purified counterparts.

Amanda Leonardi
Rensselaer Polytechnic Institute

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