

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Solvent Size Dependent Structure Of Diblock Copolymer Micelles In N-alkane**<sup>1</sup> SANGHO LEE, TAE-YOUNG HEO, SOO-HYUNG CHOI, Department of Chemical Engineering, Hongik University — Block copolymers can self-assemble into micelles in selective solvents. Theoretical description for the micelle structure is described the balance between core block stretching and core block-solvent interaction with the assumption that the core is melt state. So, core block was stretched and solvent entropy effect (e.g. solvent penetration into core) was simplified at the theoretical models. However, we observed PS-PEP micelle in squalane that the core block was nearly fully relaxed. In this study, we investigate the micelle structure as a function of solvent size. Here, we use Poly(styrene-*b*-ethylene-alt-propylene) in selective solvent such as n-alkanes. Solvents are favorable for PEP corona block and unfavorable PS core block. As solvent size decreases, solvent easily can penetrate into core, however, interaction parameter increases systematic. Critical micelle temperature (CMT) and detailed micelle structure were measured by Small-Angle X-ray Scattering. Interestingly, we observed that the CMT decreases as solvent size decreases. The core block is fully relaxed by comparing with core radius and  $2\sqrt{Rg_0}$ , PS. Almost each structure data overlapped as a function of CMT-T. This results show that block copolymer micelle can be controlled by solvent size and thus solvent entropy effect

<sup>1</sup>Ministry of Trade, Industry and Energy, Korea Evaluation Institute of Industrial Technology, Pohang Accelerator Laboratory (4C beam line)

Sangho Lee  
Department of Chemical Engineering, Hongik University

Date submitted: 12 Nov 2016

Electronic form version 1.4