

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Origin of Lateral Nanoscale Heterogeneities in Weak Polyelectrolyte Brushes YOU-YEON WON, KEVIN WITTE, JAEHYUN HUR, Purdue University — In this talk, we will first discuss experimental evidence of lateral nanoscale heterogeneities in a single-component weak polyelectrolyte brush system under zero to low salt conditions. Using an amphiphilic diblock copolymer, poly(2-(dimethylamino)ethyl methacrylate-*b* - *n*-butyl acrylate) (PDMAEMA-PnBA), for Langmuir film compression and Langmuir-Blodgett deposition on a hydrophobic substrate followed by fluid AFM imaging, we show the existence of regions of different brush heights, indicative of the thermodynamic instability (and resultant local clustering) of the PDMAEMA chains in the low-salt limit. Using SCF and scaling theories, we will also show that the lateral heterogeneities occur due to the combined effects of (i) the osmotic instability regulated by charge equilibrium and (ii) the hydrophobicity of the chains.

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Date submitted: 21 Nov 2008

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