Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Adsorption and depletion of polyelectrolytes in charged[1]
DADONG YAN, XINGKUN MAN, State Key Laboratory of Polymer Physics and Chemistry, Institute of Chemistry, Chinese Academy of Sciences, AN-CHANG SHI, Department of Physics and Astronomy, McMaster University, NSFC COLLABORATION COLLABORATION — Self-consistent field theory is presented to study the adsorption of flexible polyelectrolytes (PE) onto uniformly oppositely charged cylinders. We focus on the curvature effect of adsorbing surface on the adsorption-depletion phase- transition-like behavior. In terms of the scaling expression of the critical quantities, i.e., the salt concentration, the charge fraction of PE chain and the area density of surface charge, at the adsorption-depletion transition point have been obtained. Moreover, we find a critical line for the dependence of the critical radius of cylinder on the salt concentration, which separates the adsorption and depletion states. The theoretical results are in good agreement with the Monte Carlo simulations and the experimental results.

[1]Financial Support from National Science Foundation of China (NSFC) 20874111.

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Date submitted: 01 Dec 2008 Electronic form version 1.4