

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Dynamics of a Charged, Semi-flexible Polymer with Hydrodynamic Interaction. WON KYU KIM, Department of physics, Pohang University of Science and Technology, Pohang 790-784, South Korea, OYEON KUM, Combinatorial and Computational Mathematics Center, Pohang University of Science and Technology, Pohang 790-784, South Korea, WOKYUNG SUNG¹, PCTP and Department of Physics, Pohang University of Science and Technology, Pohang 790-784, South Korea — We study static and dynamic correlation functions of segmental charge density and orientation in a semi-flexible polyelectrolyte. The semi-flexible polymer is described by the mean-field wormlike chain model, where the effective Hamiltonian incorporates bending and stretching energies. Furthermore, we incorporate the Coulombic interaction and hydrodynamic interaction between the beads screened and mediated respectively by ionic fluid environment. We analytically calculate the correlation functions and discuss how conformation and dynamics are affected by net charge value, segmental charge fluctuation, and persistence length. The Brownian dynamic simulations are performed to support and extend the analytical results.

¹POSTECH Center for Theoretical Physics(PCTP)

Won Kyu Kim
Department of Physics, Pohang University of Science and Technology,
Pohang 790-784, South Korea

Date submitted: 28 Nov 2006

Electronic form version 1.4