

Abstract Submitted
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Single Molecule Experiments with Adsorbed Polyelectrolytes¹

SERGIY MINKO, YURI ROITER — We report on the AFM study of single polyelectrolyte (positively charged) molecules (PE) adsorbed on mica surfaces at different conditions (we vary pH and salt concentration). The study was carried out under aqueous solutions in a liquid cell. We observed behavior of PE in real time. The AFM experiments were experiments when possible effects of the AFM tip on PE conformations were minimized. A series of experiments were carried out when PE was adsorbed between two electrodes at applied electrical potential. The AFM images were processed to extract contour length, end-to-end distance, and radii of center of mass. The experiments revealed several interesting facts about adsorption of PE. The chain statistics was found to be consistent with the 2D random walk model. A decrease of charge density resulted in the coil-to-globule transition. The globules appear as a strongly deformed swollen polymer globule. In saline solutions the globules resemble necklace-like globules. PE chains were mobile if an electrical field was applied. The motion of PE chains can be describes as a caterpillar-like motion.

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