

Lysozyme binding to poly(4-vinyl-N-alkylpyridinium bromide)

Silva, Rubens A.

Urzúa, Marcela D.

Petri, Denise F.S.

The adsorption behavior of polycations at ionic strengths (I) ranging from 0.001 to 0.1 onto silicon wafers was studied by means of ellipsometry, contact angle measurements and atomic force microscopy (AFM). Polycations chosen were bromide salts of poly(4-vinylpyridine) N-alkyl quaternized with linear aliphatic chains of 2 and 5 carbon atoms, QPVP-C2 and QPVP-C5, respectively. Under $I = 0.001$ the reduction of screening effects led to low adsorbed amounts of QPVP-C2 or QPVP-C5 (1.0 ± 0.1 mg / m²), arising from the adsorption of extended chains. Upon increasing I to 0.1, screening effects led to conformational changes of polyelectrolyte chains in solution and to higher adsorbed amount values (1.9 ± 0.2 mg / m²). Advancing contact angle θ_a measurements performed with water drops onto QPVP-C2 and QPVP-C5 adsorbed layers varied from $(45 \pm 2)^\circ$ to $(50 \pm 5)^\circ$, evidencing the exposure of both hydrophobic alkyl groups and charged moieties. The adsorption of lysozyme (LYZ) molecules to QPVP-C5 I