SUPPORTING INFORMATION

Spherical Polyelectrolyte Brushes Constant Zeta Potential with Varying Ionic Strength: An Electrophoretic Study Using a Hairy Layer Approach

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In this study the ζ-potential of the bare silica particles was measured with NaCl concentrations ranging from 0.01 M to 0.2 M at pH=6. For this range of ionic strengths the Debye screening length λ_D is much smaller than the size of the particle, i.e. $r >> \lambda_D$. In these conditions the Smoluchowski formula can be used to determine the ζ-potential ζ from the electrophoretic mobility: [1]

$$\zeta = \frac{b\eta}{\varepsilon_0 \varepsilon_S} \tag{1}$$

Here b is the electrophoretic mobility of the particle; η - viscosity of the electrolyte; ε_0 and ε_s - the dielectric constants of vacuum and solution, respectively. In the description of the experimental results the well known formula of the Gouy-Chapman has been used.[2, 3]

$$\zeta = \frac{4RT}{F} \cdot \mathrm{artanh}\left(\exp(-kx) \cdot \tanh\left(\frac{F\varphi_S}{4RT}\right)\right) \tag{2}$$

Where φ_s is the surface potential; R- gas constant; T- temperature; F- the Faraday number; x slipping plane (the distance from the surface of the particle); κ- inverse Debye screening length (see equation 3), c- the electrolyte concentration in the volume of the solution).

$$\left(k = \sqrt{\frac{2F^2 c}{\varepsilon_0 \varepsilon_S RT}}\right) \tag{3}$$

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