APPENDIX D

Streaming Potential Error Analysis

$$\sigma_{\delta}^{2} = \sigma_{V_s^p}^{2}\left(\frac{\partial \delta}{\partial V_s^p}\right)^2 + \sigma_{V_s^o}^{2}\left(\frac{\partial \delta}{\partial V_s^o}\right)^2$$

σ_i = *standard deviation of i*

V_s^p = *voltage due to the polymer solution,mV*

V_s^o = *voltage due to the buffer solution, mV*

δ = *hydrodynamic layer thickness, nm*

κ^{-1} = *Debye length, nm*$^{-1}$

$$\delta = \kappa^{-1} \ln \frac{V_s^p}{V_s^o}$$

Assuming $\sigma_{V_s^o} = \sigma_{V_s^p}$, *and knowing* $\sigma_{V_s^o} = 1mV$

$$\sigma_{\delta} = \kappa^{-1}\left[\left(\frac{1}{V_s^o}\right)^2 + \left(\frac{1}{V_s^p}\right)^2\right]^{1/2}$$