$$\varepsilon = k_{\mathrm{B}}T$$

$$\varepsilon_{\mathrm{r}} = 1.0$$

$$\sigma = 1$$

Set Bjerrum length equal to σ

$$\lambda_{\mathrm{B}} = \frac{e^2}{4\pi\varepsilon_{\mathrm{o}}\varepsilon_{\mathrm{r}}k_{\mathrm{B}}T} = \sigma$$

e is the elementary charge

$$q^* = \frac{q}{\sqrt{4\pi\varepsilon_{\mathrm{o}}\sigma\varepsilon}}$$

$$\frac{e}{\sqrt{\lambda_{\mathrm{B}}/\sigma}} = \sqrt{4\pi\varepsilon_{\mathrm{o}}\varepsilon_{\mathrm{r}}k_{\mathrm{B}}T} = \sqrt{4\pi\varepsilon_{\mathrm{o}}\sigma\varepsilon}$$

$$q^* = \frac{q}{e/\sqrt{\lambda_{\mathrm{B}}/\sigma}} = \frac{q}{e}$$