6. From Equation 6.19,

$$K = \frac{e^2}{4\pi\varepsilon_0}\frac{Zz}{d} = \frac{(1.440\,\text{MeV}\cdot\text{fm})(2)(79)}{7.0\,\text{fm}} = 33\,\text{MeV}$$

7. $$d = \frac{e^2}{4\pi\varepsilon_0}\frac{Zz}{K} = \frac{(1.440\,\text{MeV}\cdot\text{fm})(2)(29)}{7.4\,\text{MeV}} = 11.3\,\text{fm}$$

14. From the Rutherford scattering formula (Eq. 6.14) the only difference between the two positions is the term depending on the angle – all other parameters are the same for the two experiments. The expected ratio between the two counting rates is then

$$\frac{N(150°)}{N(10°)} = \frac{\sin^{-4}(150°/2)}{\sin^{-4}(10°/2)} = 6.63\times10^{-5}$$

so the rate at 150° would be $(11.3/s)(6.63 \times 10^{-5}) = 7.49 \times 10^{-4}$ /s.