

60. (a) The potential on the surface is

$$V = \frac{q}{4\pi\epsilon_0 R} = \frac{(4.0 \times 10^{-6} \text{ C}) \left(8.99 \times 10^9 \frac{\text{N}\cdot\text{m}^2}{\text{C}^2}\right)}{0.10 \text{ m}} = 3.6 \times 10^5 \text{ V} .$$

(b) The field just outside the sphere would be

$$E = \frac{q}{4\pi\epsilon_0 R^2} = \frac{V}{R} = \frac{3.6 \times 10^5 \text{ V}}{0.10 \text{ m}} = 3.6 \times 10^6 \text{ V/m} ,$$

which would have exceeded 3.0 MV/m. So this situation cannot occur.