

35. Charge is distributed uniformly over the surface of the sphere and the electric field it produces at points outside the sphere is like the field of a point particle with charge equal to the net charge on the sphere. That is, the magnitude of the field is given by $E = q/4\pi\epsilon_0 r^2$, where q is the magnitude of the charge on the sphere and r is the distance from the center of the sphere to the point where the field is measured. Thus,

$$q = 4\pi\epsilon_0 r^2 E = \frac{(0.15 \text{ m})^2 (3.0 \times 10^3 \text{ N/C})}{8.99 \times 10^9 \text{ N} \cdot \text{m}^2/\text{C}^2} = 7.5 \times 10^{-9} \text{ C} .$$

The field points inward, toward the sphere center, so the charge is negative: $-7.5 \times 10^{-9} \text{ C}$.