

7. Since the charge is uniformly distributed throughout a sphere, the electric field at the surface is exactly the same as it would be if the charge were all at the center. That is, the magnitude of the field is

$$E = \frac{q}{4\pi\epsilon_0 R^2}$$

where q is the magnitude of the total charge and R is the sphere radius. The magnitude of the total charge is Ze , so

$$E = \frac{Ze}{4\pi\epsilon_0 R^2} = \frac{(8.99 \times 10^9 \text{ N} \cdot \text{m}^2/\text{C}^2)(94)(1.60 \times 10^{-19} \text{ C})}{(6.64 \times 10^{-15} \text{ m})^2} = 3.07 \times 10^{21} \text{ N/C} .$$

The field is normal to the surface and since the charge is positive, it points outward from the surface.