

61. If the electric potential is zero at infinity then at the surface of a uniformly charged sphere it is  $V = q/4\pi\epsilon_0 R$ , where  $q$  is the charge on the sphere and  $R$  is the sphere radius. Thus  $q = 4\pi\epsilon_0 R V$  and the number of electrons is

$$N = \frac{|q|}{e} = \frac{4\pi\epsilon_0 R |V|}{e} = \frac{(1.0 \times 10^{-6} \text{ m})(400 \text{ V})}{(8.99 \times 10^9 \text{ N}\cdot\text{m}^2/\text{C}^2)(1.60 \times 10^{-19} \text{ C})} = 2.8 \times 10^5 .$$