

53. Using Eq. 26-27, with  $\sigma = q/A$ , we have

$$|\vec{E}| = \frac{q}{\kappa\epsilon_0 A} = 200 \times 10^3 \text{ N/C}$$

which yields  $q = 3.3 \times 10^{-7} \text{ C}$ . Eq. 26-21 and Eq. 26-25 therefore lead to

$$U = \frac{q^2}{2C} = \frac{q^2 d}{2\kappa\epsilon_0 A} = 6.6 \times 10^{-5} \text{ J} .$$