

P #46

Ch 16 - pg 527

$$V = 1.00 \times 10^8 \text{ V}$$

$$Q = 50.0 \text{ C}$$

Find U_c :

$$U_c = \frac{1}{2} \cdot Q \cdot V$$

$$= \frac{1}{2} (50 \text{ C})(1.00 \times 10^8 \text{ V})$$

$$U_c = 2.5 \times 10^9 \text{ J}$$

Find 1% of U_c : $= (0.01)(2.5 \times 10^9 \text{ J})$

$$= 2.5 \times 10^7 \text{ J}$$

Find m :

$$Q = Q_{\text{change temp}} + Q_{\text{vaporize}}$$

30°C to 100°C

$$= m \cdot c \cdot \Delta T + m \cdot H_v$$

$$= m \cdot (4186 \text{ J/kg} \cdot ^\circ\text{C}) \cdot (100^\circ\text{C} - 30^\circ\text{C}) + m \cdot (2.26 \times 10^6 \text{ J/kg})$$

$$2.5 \times 10^7 \text{ J} = m \cdot (2553000)$$

$$m = 9.79 \text{ kg}$$