

hhh.schaums.18.26_18.30

18.26 Heat gained by the ice must equal heat lost by the water

or simply

$$m_{ice} L_f + m_{ice} C(T_f - 0) = m_{water} C(50 - T_f)$$

18.27

Total heat = heat to melt ice + heat to warm water from 0 to 100° + heat to turn water into steam

$$Q = mL_f + mC \cdot 100m + mL_v$$

18.28 Heat Lost = Heat Gained

$$m_{steam} L_v + m_{steam} C(100 - T_f) = m_{water} (T_f - 40)$$

18.29 Heat needed = (heat to heat water + heat to turn water into steam)/efficiency as decimal

$$(m_{water} C \cdot 100 + m_{water} L_v) / 0.60$$

$$total_calories_required \left(\frac{1kcal}{1000cal} \right) \left(\frac{mole}{373kcal} \right) \left(\frac{22.4liters}{1mole} \right) = \text{_____}$$

18.30 Heat gained = heat lost

$$m_{ice} L_f + m_{calorimeter} C_{cal} T_f + m_{ice} T_f = m_{water} C_{water} (T_i - T_f)$$