

$$6) T_2 = ?$$

$$T_{A1} = 10^\circ\text{C}$$

$$T_{B1} = 80^\circ\text{C}$$

$$c_w = 4180 \text{ J/kg}^\circ\text{C}$$

$$m_A = 2 \times 10^2 \text{ g} = m_B \\ = .200 \text{ kg}$$

$$Q_A = -Q_B$$

$$m_A c_A \Delta T_A = -m_B c_B \Delta T_B$$

$$m_A c_A (T_2 - T_{A1}) = -m_B c_B (T_2 - T_{B1})$$

$$T_2 - T_{A1} = -T_2 + T_{B1}$$

$$T_2 + T_2 = T_{B1} + T_{A1}$$

$$2T_2 = T_{B1} + T_{A1}$$

$$T_2 = \frac{T_{B1} + T_{A1}}{2} = 45.0^\circ\text{C}$$

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$$Q_A = -Q_B$$

$$m_A c_A (T_2 - T_{A1}) = -m_B c_B (T_2 - T_{B1})$$

$$m_A c_A T_2 - m_A c_A T_{A1} = -m_B c_B T_2 + m_B c_B T_{B1}$$

$$m_A c_A T_2 + m_B c_B T_2 = m_B c_B T_{B1} + m_A c_A T_{A1}$$

$$T_2 (m_A c_A + m_B c_B) = m_B c_B T_{B1} + m_A c_A T_{A1}$$

$$T_2 = \frac{(m_B c_B T_{B1} + m_A c_A T_{A1})}{(m_A c_A + m_B c_B)}$$

$$= 59.5^\circ\text{C}$$

8

$$m_F = 1.00 \times 10^2 \text{ g} \\ = 0.100 \text{ kg}$$

$$T_{F1} = 100.0^\circ\text{C} \quad T_2 = 45.0^\circ\text{C}$$

$$T_{W1} = 35.0^\circ\text{C} \quad T_2 = 45.0^\circ\text{C}$$

$$m_W = 1.00 \times 10^2 \text{ g} \\ = 0.100 \text{ kg} \quad c_W = 4180 \text{ J/kg}^\circ\text{C} \\ c_F = ?$$

$$Q_F = -Q_W$$

$$m_F c_F \Delta T_F = -m_W c_W \Delta T_W$$

$$c_F = \frac{-m_W c_W \Delta T_W}{m_F \Delta T_F}$$

$$= 253 \text{ J/kg}^\circ\text{C}$$

9)

$$c = 836 \text{ J/kg}^\circ\text{C}$$