

SHC Starter Questions - Answers

SQ 1

a $Q = m c \Delta\theta = 0.30 \times 900 \times (100 - 15) = 22950 \text{ J} = 23 \text{ kJ (2 s.f.)}$

b $Q = m c \Delta\theta = 1.50 \times 4200 \times (100 - 15) = 536 \text{ kJ}$

SQ 2

a Total energy required $Q = 536 + 23 \text{ kJ} = 559 \text{ kJ}$

Energy = Power x time, so $t = Q/P = 559 \text{ kJ} / 2 \text{ kW} = 280 \text{ s}$

b $Q = m_c c_c \Delta\theta + m_w c_w \Delta\theta = (m_c c_c + m_w c_w) \Delta\theta$ as temperature change is the same

$Q = (20 \times 390 + 80 \times 4200) \times (50 - 20) = 10.3 \text{ MJ}$

10.17

$$P \times t = m c \Delta\theta$$

$$t = m c \Delta\theta / P = 0.0033 \times 385 \times (370 - 15) / 45 = 10 \text{ s}$$

10.15

$$Q = m c \Delta\theta = 5000 \times 420 \times (1537 - 20) = 3.2 \text{ GJ}$$