$$m_w s_w (100 - T) = m_i s_i \times 15 + m_i L_f + m_i s_w T$$

$$8 \times 4186 (100 - T) = 0.5 \times 2100 \times 15 + 0.5 \times 3.36 \times 10^5 + 0.5 \times 4186 \times T$$

$$3348800 - 33488T = 15750 + 168000 + 2093T$$

$$3165050 = 35581\,T$$

$$T = \frac{3165050}{35581} = 88.95^\circ C$$

$$T \approx 89^\circ C.$$