

29. The melting point of silver is 1235 K, so the temperature of the silver must first be raised from 15.0°C (= 288 K) to 1235 K. This requires heat

$$Q = cm(T_f - T_i) = (236 \text{ J/kg} \cdot \text{K})(0.130 \text{ kg})(1235^\circ\text{C} - 288^\circ\text{C}) = 2.91 \times 10^4 \text{ J} .$$

Now the silver at its melting point must be melted. If L_F is the heat of fusion for silver this requires

$$Q = mL_F = (0.130 \text{ kg})(105 \times 10^3 \text{ J/kg}) = 1.36 \times 10^4 \text{ J} .$$

The total heat required is $2.91 \times 10^4 \text{ J} + 1.36 \times 10^4 \text{ J} = 4.27 \times 10^4 \text{ J}$.