54. (a) Starting from $\sum Q = 0$ (for calorimetry problems) we can derive (when no phase changes are involved)

$$T_f = \frac{c_1 m_1 T_1 + c_2 m_2 T_2}{c_1 m_1 + c_2 m_2} = -44.2^\circ\text{C} \ ,$$

which is equivalent to 229 K.

(b) From Eq. 21-1, we have

$$\Delta S_{\text{tungsten}} = \int_{303}^{229} \frac{c\, m\, dT}{T} = (134)(0.045) \ln\left(\frac{229}{303}\right) = -1.69 \text{ J/K} \ .$$

(c) Also,

$$\Delta S_{\text{silver}} = \int_{153}^{229} \frac{c\, m\, dT}{T} = (236)(0.025) \ln\left(\frac{229}{153}\right) = 2.37 \text{ J/K} \ .$$

(d) The net result for the system is $2.37 - 1.69 = 0.68$ J/K. (Note: these calculations are fairly sensitive to round-off errors. To arrive at this final answers, the value 273.15 was used to convert to Kelvins, and all intermediate steps were retained to full calculator accuracy.)