

25. The resistance at operating temperature T is $R = V/i = 2.9 \text{ V}/0.30 \text{ A} = 9.67 \text{ } \Omega$. Thus, from $R - R_0 = R_0\alpha(T - T_0)$, we find

$$T = T_0 + \frac{1}{\alpha} \left(\frac{R}{R_0} - 1 \right) = 20^\circ\text{C} + \left(\frac{1}{4.5 \times 10^{-3}/\text{K}} \right) \left(\frac{9.67 \text{ } \Omega}{1.1 \text{ } \Omega} - 1 \right) = 1.9 \times 10^3 \text{ } ^\circ\text{C}.$$

Since a change in Celsius is equivalent to a change on the Kelvin temperature scale, the value of α used in this calculation is not inconsistent with the other units involved. Table 26-1 has been used.