Answer on Question #58709, Physics / Molecular Physics | Thermodynamics |

A certain resistance thermometer at triple point of water has resistance of 152.0Ω. What is the temperature of the system in degrees Celsius when the resistance of the thermometer is 230.51Ω?

414.2°C

141.0°C

253.2°C

80.4°C

Solution:

The triple point of water is 273.16 K or 0.01 °C.

$$T(R) = T_{tr} \frac{R}{R_{tr}}$$

Hence,

$$T = 273.16 \cdot \frac{230.51}{152.0} = 414.25 \text{ K}$$

Here is the formula to convert Kelvin into Celsius: °C = K - 273.15.

Thus,

$$T = 414.25 - 273.15 = 141.1 \approx 141.0°C$$

Answer: 141.0°C