

**QUESTION:**

The temperature of a body is increased from -173 C to 357 C. What is the ratio of energies emitted by the body per second in these two cases?

**ANSWER**

According to the Stefan–Boltzmann law the total energy radiated per unit surface area of a black body across all wavelengths per unit time is  $\epsilon = \sigma T^4$

Hence (-173 C=100 K, 357 C = 630 K)

$$\frac{\epsilon_1}{\epsilon_2} = \left(\frac{T_1}{T_2}\right)^4$$

$$\frac{\epsilon_1}{\epsilon_2} = \left(\frac{100}{630}\right)^4 = 6.348 \cdot 10^{-4}$$

**ANSWER**

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