

$$1-1. (1) \lambda_m = \frac{b}{T} = \frac{2.898 \times 10^{-3}}{3} \approx 9.66 \times 10^{-4} \text{ m}$$

$$(2) 4\pi \cdot R_{\text{地}}^2 \cdot \sigma \cdot T^4 \approx 2.34 \times 10^9 \text{ W}$$

$$1-2. (1) L = I_0 \cdot 4\pi \cdot R_S^2 \cdot \epsilon$$

$$(2) \sigma T^4 \cdot 4\pi \cdot R_S^2 = I_0 \cdot 4\pi \cdot R_S^2 \cdot \epsilon$$

$$T = \sqrt[4]{\frac{I_0 \cdot R_S^2 \cdot \epsilon}{\sigma \cdot R_S^2}}$$

$$1-3. M_0(\lambda, T) = \frac{2\pi c^2 h}{\lambda^5} \cdot \frac{1}{e^{hc/\lambda kT} - 1}$$

$$\text{在 } \lambda = \lambda_m \text{ 时 } \frac{dM_0(\lambda, T)}{d\lambda} = 0$$

$$\text{而上式} \text{ 为 } -5 \times \frac{2\pi c^2 h}{\lambda^6} \cdot \frac{1}{e^{hc/\lambda kT} - 1} + \frac{2\pi c^2 h}{\lambda^5} \cdot \frac{1}{(e^{hc/\lambda kT} - 1)^2} \cdot \frac{hc}{\lambda^2 kT} \cdot e^{hc/\lambda kT}$$

$$= \frac{2\pi c^2 h}{\lambda^6} \cdot \frac{1}{(e^{hc/\lambda kT} - 1)^2} \cdot \left(-5(e^{hc/\lambda kT} - 1) + \frac{hc}{\lambda kT} e^{hc/\lambda kT} \right)$$

$$-5 \cdot e^{\frac{hc}{\lambda kT}} + 5 + \frac{hc}{\lambda kT} \cdot e^{\frac{hc}{\lambda kT}} = 0, \text{ 在大于0处有唯一解 } \left(\frac{hc}{\lambda kT} \right)$$

$$\therefore \frac{hc}{\lambda_m kT} = C, \therefore \lambda_m \cdot T = \frac{hc}{kC} \text{ (常数)}$$

$$1-4. 0.259 \times 10 \times 10^{-4} \times \sigma \cdot T^4 = 235 \text{ W}$$

$$1-5. (1) \nu_0 = \frac{2.3 \text{ eV}}{h} = \frac{2.3 \times 1.6 \times 10^{-19}}{6.626 \times 10^{-34}} = 5.55 \times 10^{14} \text{ Hz}$$

$$\lambda_0 = \frac{c}{\nu_0} = 5.4 \times 10^{-7} \text{ m}$$

$$(2) E_{k-\max} = h \cdot \nu - W = 6.626 \times 10^{-34} \times 5.55 \times 10^{14} - 2.3 \text{ eV}$$

$$\approx 9.46 \times 10^{-20} \text{ J}$$

$$E_{k-\min} = 0 \text{ J}$$

$$(3) \frac{E_{k-\max}}{e} = \frac{9.46 \times 10^{-20}}{1.6 \times 10^{-19}} = 0.59 \text{ V}$$

$$6. \text{ 对于 } T_2: S \cdot \sigma \cdot T_1^4 - S \cdot \sigma \cdot T_2^4 + S \cdot \sigma \cdot T_3^4 - S \cdot \sigma \cdot T_2^4 = 0$$

$$\Rightarrow T_1^4 + T_3^4 = 2T_2^4$$

$$\text{同理 } T_2^4 + T_4^4 = 2T_3^4$$

$$\begin{cases} T_2 = \sqrt[4]{\frac{2T_1^4 + T_4^4}{3}} \\ T_3 = \sqrt[4]{\frac{T_1^4 + 2T_4^4}{3}} \end{cases}$$

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