

$E = \sigma T^4$ $\sigma = 5.67 \times 10^{-8} [\text{W}/(\text{m}^2 \cdot \text{K}^4)]$ $\lambda_{\text{max}} T = \text{一定} (2.88 \times 10^{-3} \text{m} \cdot \text{K})$ 光強度 E : $[\text{W}/\text{m}^2]$ $1[\text{nm}] = 10^{-9}[\text{m}]$
 ボルツマン定数 k : $1.38 \times 10^{-23} [\text{J}/\text{K}]$
 絶対温度 T : $[\text{K}]$ 光速 c : $3.00 \times 10^8 [\text{m}/\text{s}]$
 光の波長 λ : $[\text{m}]$ 光の振動数 ν : $[\text{Hz}]$
 プランク定数 h : $6.63 \times 10^{-34} [\text{J} \cdot \text{s}]$
 KE : 運動エネルギー $[\text{J}]$ V_{max} : 逆電圧: $[\text{V}]$

$$E = \frac{8\pi h}{\lambda^3} \frac{1}{\left\{ e^{\left(\frac{hc}{\lambda kT} \right)} - 1 \right\}}$$

$$KE = eV_{\text{max}} = \frac{1}{2} m v_0^2 \quad c = \lambda \nu$$

$$E = h \nu$$

$$h \nu = \frac{1}{2} m v_0^2 + W$$

$$1[\text{eV}] = 1.6 \times 10^{-19} [\text{J}]$$

金属名	仕事関数 W [eV]
Na (ナトリウム)	2.30
Zn (亜鉛)	4.20
Pt (白金)	5.30

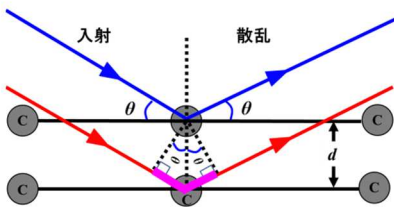
光のエネルギー E : $[\text{J}]$ 光の振動数 ν : $[\text{Hz}]$
 プランク定数 h : $6.63 \times 10^{-34} [\text{J} \cdot \text{s}]$ 仕事関数 W : [eV]
 電子の電荷 e : $1.60 \times 10^{-19} [\text{C}]$
 電子の質量 m : $9.109 \times 10^{-31} [\text{kg}]$ 電子の速度 v_0 : $[\text{m}/\text{s}]$

$$\frac{1}{\lambda} = R \left(\frac{1}{n'^2} - \frac{1}{n^2} \right) \frac{m e^4}{8 \epsilon_0^2 h^2} = 2.17 \times 10^{-18} [\text{J}]$$

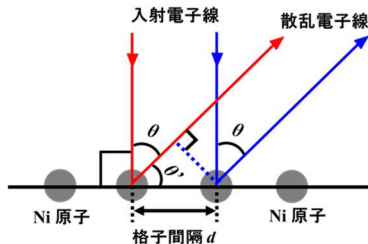
$$E_n = - \frac{m e^4}{8 \epsilon_0^2 h^2} \frac{1}{n^2} \quad (n=1,2,3)$$

$$r = \frac{\epsilon_0 h^2}{\pi m e^2} \quad F = mg \quad F = eE$$

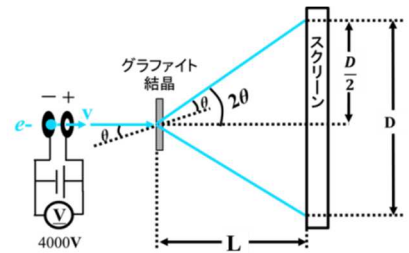
$$\lambda = \frac{h}{p} = \frac{h}{mv} \quad eV = \frac{1}{2} m v^2$$



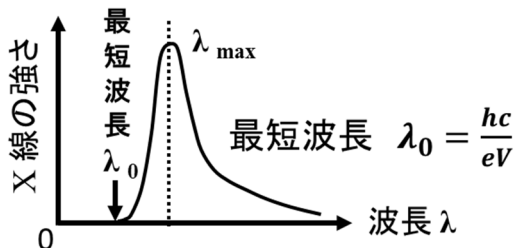
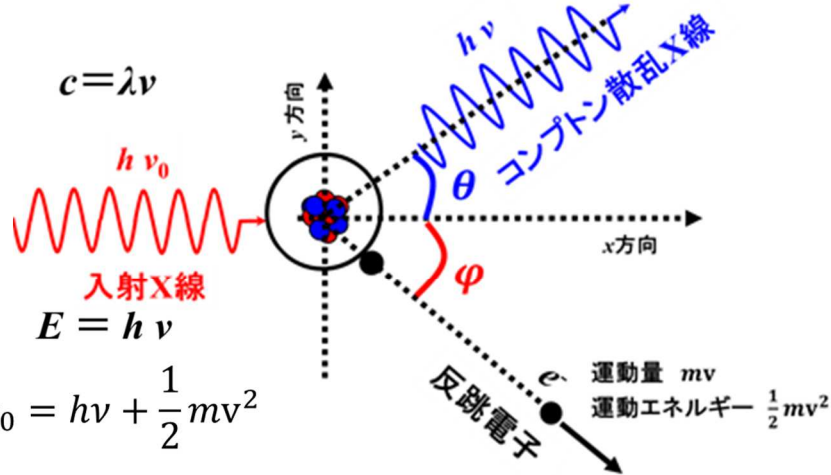
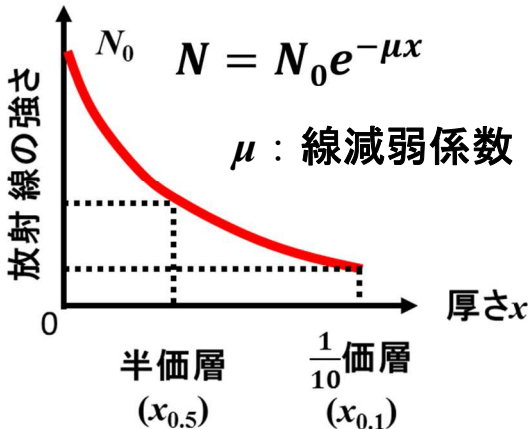
$$2d \sin \theta = n \lambda$$



$$d \cos \theta' = d \sin \theta = n \lambda$$



$$\lambda = 2d \sin \left(\frac{\tan^{-1} \left(\frac{D}{2L} \right)}{2} \right)$$



$$\frac{h \nu_0}{c} = \frac{h \nu}{c} \cos \theta + m v \cos \varphi \quad 0 = \frac{h \nu}{c} \sin \theta - m v \sin \varphi$$

$$\Delta \lambda = \lambda - \lambda_0 = \frac{h}{m c} (1 - \cos \theta)$$