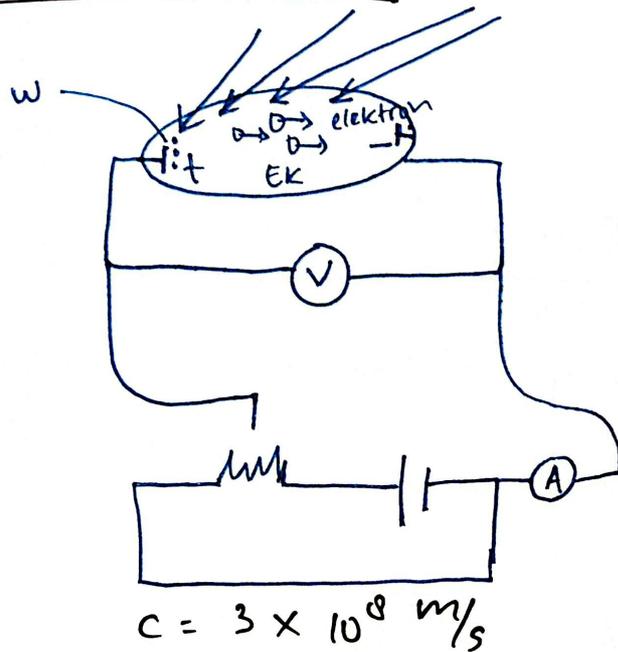


# Efek Fotolistrik

11/03 2025



$$E_k = hf = \frac{hc}{\lambda}$$

$$\frac{1}{\lambda} = \frac{c}{\lambda}$$

$$\lambda = 7000 \text{ \AA}$$

$$= \frac{3 \times 10^8}{7 \times 10^{-7}} = 4,29 \times 10^{14} \text{ Hz}$$

$$E_k = hf - w \longrightarrow w = hf_0$$

$$= hf - hf_0$$

$$= h(f - f_0)$$

$$f = \frac{c}{\lambda}$$

## Contoh Soal

1. Dik:  $\lambda = 1000 \text{ nm} \longrightarrow \lambda = 10^{-6} \text{ m}$

$$c = 3 \times 10^8 \text{ m/s}$$

$$h = 6,63 \times 10^{-34} \text{ Js}$$

dit: Berapa eV energi cahaya merah tsb?  
Momentum?

$$\text{Jawab: } E = \frac{hc}{\lambda} = \frac{(6,63 \times 10^{-34})(3 \times 10^8)}{10^{-6}}$$

$$= \frac{19,89 \times 10^{-26}}{10^{-6}}$$

$$= 19,89 \times 10^{-26} \cdot 10^6 = 19,89 \times 10^{-20}$$

$$1 \text{ eV} = 1,6 \times 10^{-19} \text{ J}$$

$$E = \frac{19,89 \times 10^{-20}}{1,6 \times 10^{-19}} = 1,24 \text{ eV}$$

2. Momentum foton

$$p = \frac{E}{c} = \frac{1,9878 \times 10^{-19}}{3 \times 10^8} \\ = 6,63 \times 10^{-28} \text{ kgm/s}$$

3.  $E = \frac{1}{2} mv^2$

$$m = 9,109 \times 10^{-31} \text{ kg}$$

$$f = 1,9878 \times 10^{-19} \text{ J}$$

$$v = \sqrt{\frac{2F}{m}} = \sqrt{\frac{2 \times 1,9878 \times 10^{-19}}{9,109 \times 10^{-31}}} \\ = \sqrt{\frac{3,9756 \times 10^{-19}}{9,109 \times 10^{-31}}} \\ = \sqrt{4,363 \times 10^{11}} \\ = 6,61 \times 10^5 \text{ m/s} \\ = 660,642 \text{ m/s}$$