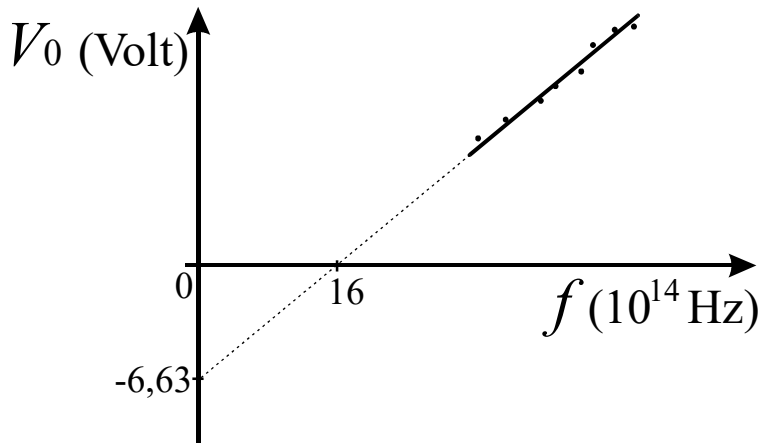


ΑΣΚΗΣΗ 1



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

$$e = 1,6 \cdot 10^{-19} \text{ C}$$

$$\phi = ?$$

$$h = ?$$

$$V_0 = ? \quad (f = 32 \cdot 10^{14} \text{ Hz})$$

ΛΥΣΗ Άσκησης 1

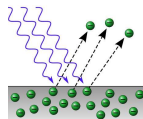
$$V_0 = \frac{h}{e} f - \frac{\phi}{e}$$

$$\bullet \quad -6,63 = \frac{h}{e} 0 - \frac{\phi}{e} \Rightarrow \frac{\phi}{e} = 6,63 \text{ V} \quad (1) \Rightarrow \underline{\phi = 6,63 \text{ eV}} \xrightarrow{\times 1,6 \cdot 10^{-19}} \underline{\phi = 10,608 \cdot 10^{-19} \text{ J}}$$

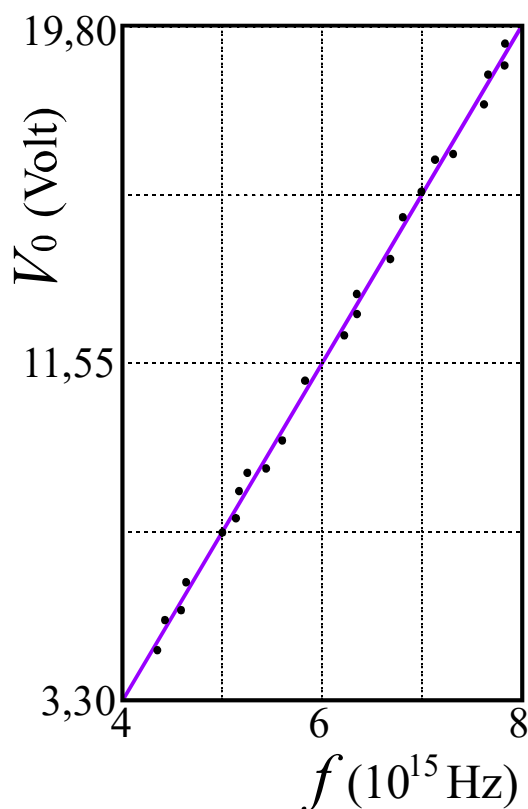
$$\bullet \quad 0 = \frac{h}{e} 16 \cdot 10^{14} - \frac{\phi}{e} \Rightarrow \frac{\phi}{e} = \frac{h}{e} 16 \cdot 10^{14} \xrightarrow{(1)} 6,63 \text{ V} = \frac{h}{e} 16 \cdot 10^{14} \Rightarrow 6,63 \text{ eV} = h \cdot 16 \cdot 10^{14} \rightarrow$$

$$\xrightarrow{\times 1,6 \cdot 10^{-19}} 6,63 \cdot 1,6 \cdot 10^{-19} = h \cdot 16 \cdot 10^{14} \Rightarrow h = \frac{6,63 \cdot 1,6 \cdot 10^{-19}}{16 \cdot 10^{14}} \Rightarrow \underline{h = 6,63 \cdot 10^{-34} \text{ J} \cdot \text{s}}$$

$$\bullet \quad V_0 = \frac{h}{e} f - \frac{\phi}{e} = \frac{6,63 \cdot 10^{-34}}{1,6 \cdot 10^{-19}} 32 \cdot 10^{14} - \frac{6,63 \cdot 1,6 \cdot 10^{-19}}{1,6 \cdot 10^{-19}} = 6,63 \cdot 2 - 6,63 \Rightarrow \underline{V_0 = 6,63 \text{ Volt}}$$



ΑΣΚΗΣΗ 2



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

$$e = 1,6 \cdot 10^{-19} \text{ C}$$

$$\phi = ? \text{ (σε eV)}$$

$$f_0 = ?$$

$$h = ?$$

ΛΥΣΗ Άσκησης 2

$$V_0 = \frac{h}{e} f - \frac{\phi}{e}$$

$$\left. \begin{aligned} \bullet 19,80 &= \frac{h}{e} 8 \cdot 10^{15} - \frac{\phi}{e} \quad (1) \\ \bullet 3,30 &= \frac{h}{e} 4 \cdot 10^{15} - \frac{\phi}{e} \quad (2) \end{aligned} \right\} \xrightarrow{(-)} 19,80 - 3,30 = \frac{h}{e} (8 \cdot 10^{15} - 4 \cdot 10^{15}) \Rightarrow 16,5 = \frac{h}{e} 4 \cdot 10^{15} \Rightarrow \frac{h}{e} = \frac{16,5}{4 \cdot 10^{15}} \quad (3)$$

$$(2), (3): 3,30 = \frac{16,5}{4 \cdot 10^{15}} 4 \cdot 10^{15} - \frac{\phi}{e} \Rightarrow 3,30 = 16,5 - \frac{\phi}{e} \Rightarrow \frac{\phi}{e} = 16,5 - 3,3 \Rightarrow \frac{\phi}{e} = 13,2 \text{ V} \quad (4) \Rightarrow \underline{\phi = 13,2 \text{ eV}}$$

$$\bullet f_0 = \frac{\phi}{h} \xrightarrow{(\div e)(\div e)} f_0 = \frac{\phi/e}{h/e} \xrightarrow{(3),(4)} f_0 = \frac{13,2}{\frac{16,5}{4 \cdot 10^{15}}} \Rightarrow \underline{f_0 = 3,2 \cdot 10^{15} \text{ Hz}}$$

$$\bullet (3): \frac{h}{e} = \frac{16,5}{4 \cdot 10^{15}} \Rightarrow h = \frac{16,5}{4 \cdot 10^{15}} e = \frac{16,5}{4 \cdot 10^{15}} 1,6 \cdot 10^{-19} \Rightarrow \underline{h = 6,6 \cdot 10^{-34} \text{ J} \cdot \text{s}}$$