PHOTOELECTRIC EFFECT USING VISIBLE LIGHT
25-Feb-20

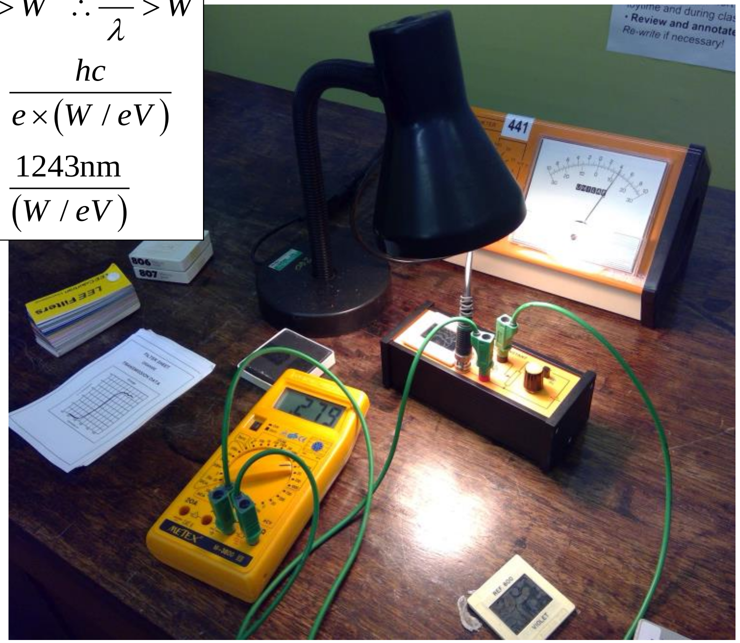
speed of light c /ms^-1	**electron charge e /C**
2.998E+08	1.60E-19

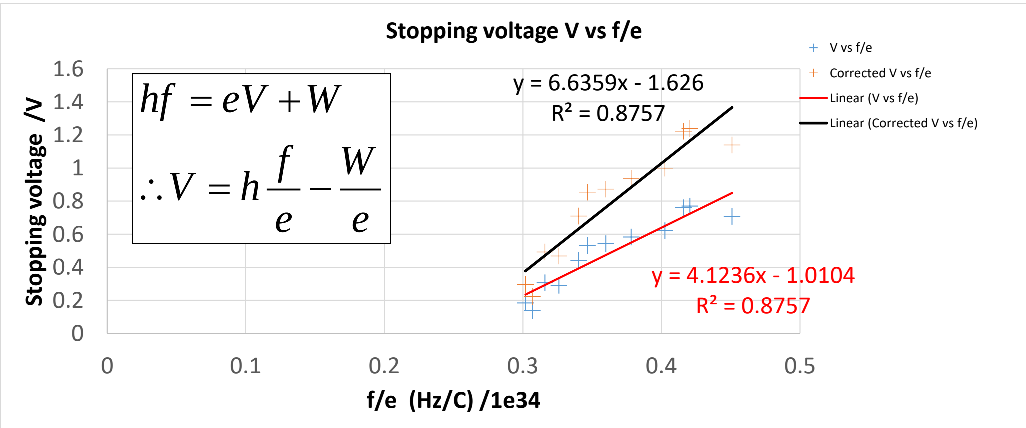
Colour of filter	Wavelength/nm	Stopping voltage /V	'corrected' stopping voltage	frequency /Hz	f/e / 1e34
Red	620	0.184	0.296	4.84E+14	3.02E-01
Marius red	610	0.138	0.222	4.91E+14	3.07E-01
Orange	592.5	0.306	0.492	5.06E+14	3.16E-01
Yellow-Green	550	0.441	0.710	5.45E+14	3.40E-01
Mercury yellow	574	0.291	0.468	5.22E+14	3.26E-01
Primary green	520	0.542	0.872	5.77E+14	3.60E-01
Mercury green	540	0.531	0.854	5.55E+14	3.47E-01
Blue	465	0.621	0.999	6.45E+14	4.02E-01
Mercury blue	445	0.77	1.239	6.74E+14	4.21E-01
Blue-Green	495	0.583	0.938	6.06E+14	3.78E-01
Violet	415	0.708	1.139	7.22E+14	4.51E-01
Ultimate violet	450	0.76	1.223	6.66E+14	4.16E-01

$$hf > W \quad \therefore \frac{hc}{\lambda} > W$$

$$\lambda < \frac{hc}{e \times (W / eV)}$$

$$\lambda < \frac{1243\text{nm}}{(W / eV)}$$





Work function for Cs /eV	1.01	(Pure Cs is 2.1eV)

http://hyperphysics.phy-astr.gsu.edu/hbase/Tables/photoelec.html

Planck's constant h (/ 1e-34 Js)	4.12	(Actual is 6.63e-34 Js)

The work function is about half of what pure Cs is supposed to be, and h is about 62% of what it is supposed to be.

The corrected reverse bias is what is needed to yield the right value for h.
Note this yields a W of 1.63eV, which means a maximum wavelength (in nm) of:
762.58 for the photoelectric effect to be observed.