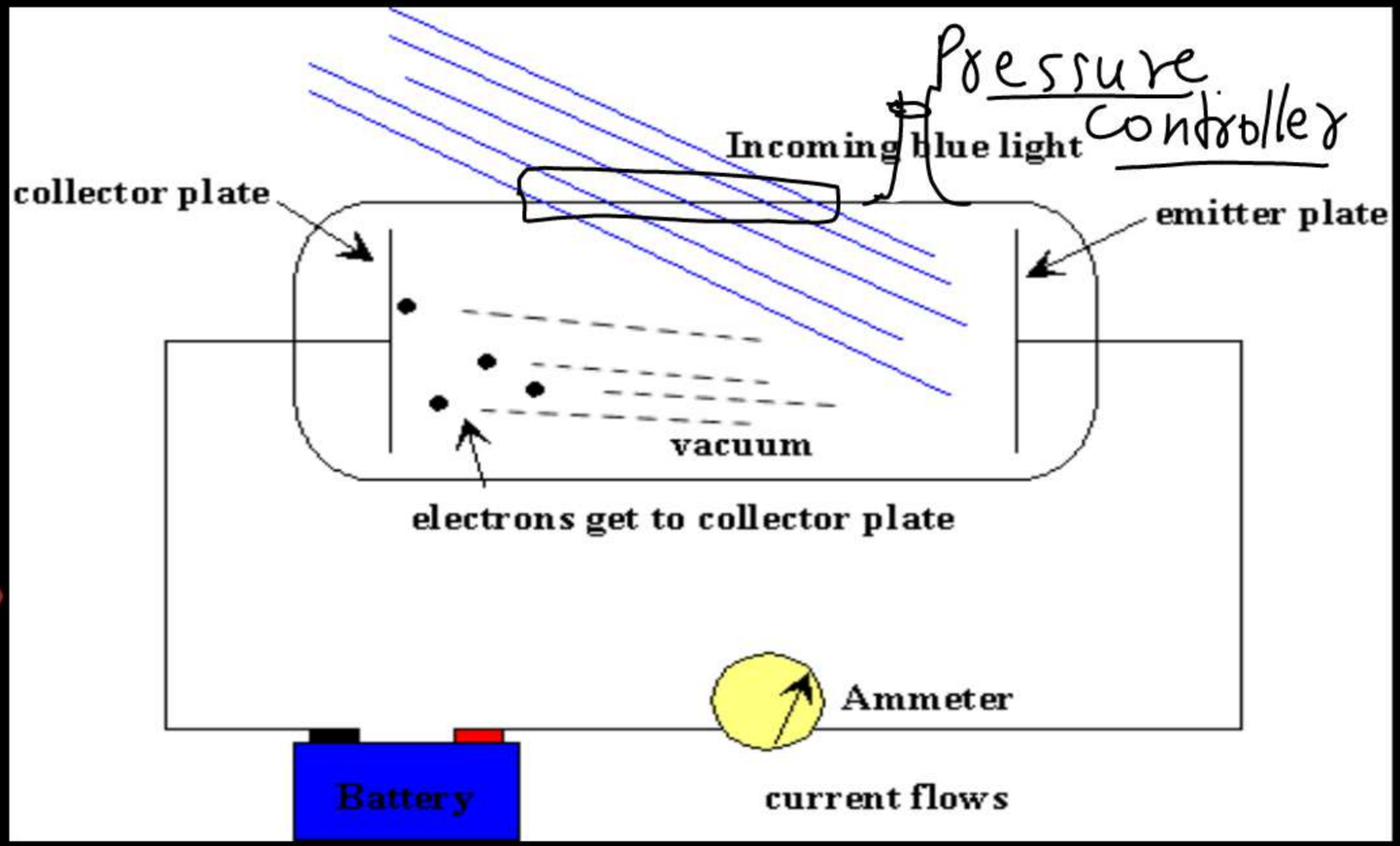
How to analyse photoelectric effect?

Multiple Parameters

Indep: intensity, frequency, voltage, ϕ

Dep: KE, V_s, I_p



Other parameters

- Quantum efficiency $= \frac{\text{no of photoelectrons emitted/s}}{\text{no of photons incident/s}} \times 100$
- KE at anode
- Threshold wavelength & frequency
- Pinch-off voltage
- Saturation current

How to analyse photoelectric effect?

no of photons is not conserved.

Multiple Parameters

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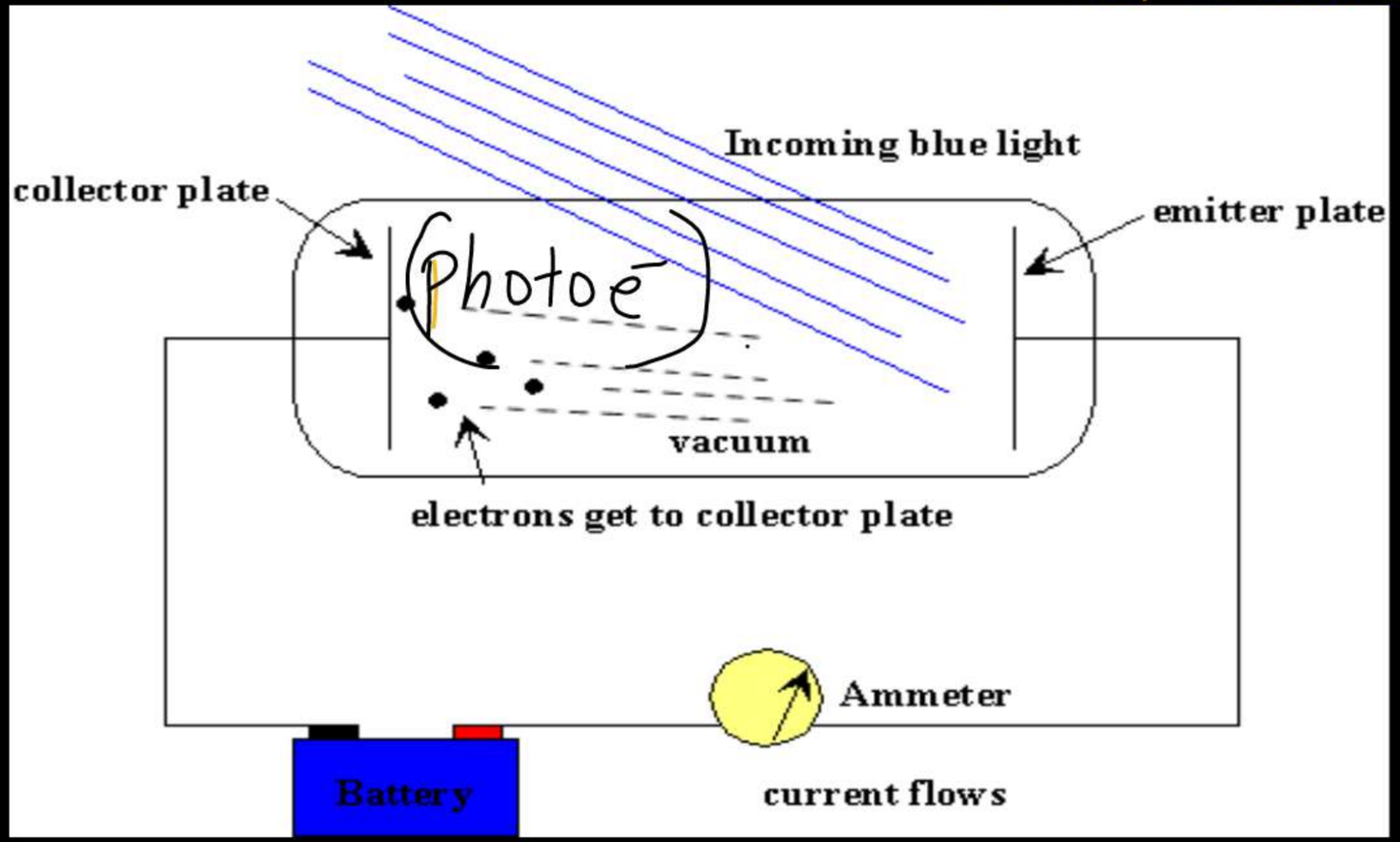

Other parameters

- Quantum efficiency
- KE at anode
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Cathode: K.E. → 0 to K_{max}

anode: eV to $K_{max} + eV$

Threshold wavelength & frequency → equivalent to work f^{n} (ϕ) (metal)

frequency of light → if freq needs to be increased or decreased, we need to change the light.

Spectrum of light

Monochromatic light

$KE_{max} = h\nu - \phi$ PEE.

Threshold λ & ν

$0 = h\nu - \phi$

$\Rightarrow h\nu = \phi$

$\Rightarrow \nu_0 = \phi/h$

ν_0 → threshold frequency.

$\frac{c}{\lambda} = \phi/h$

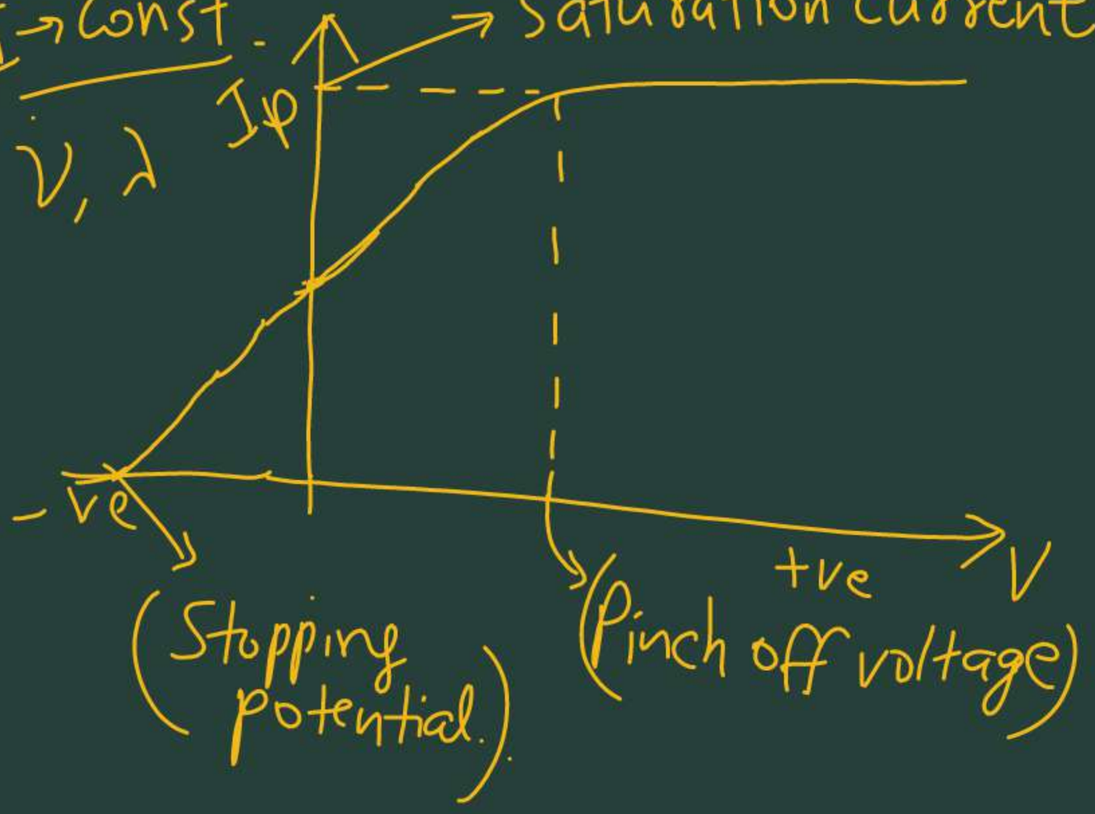
$\lambda_0 = \frac{ch}{\phi}$

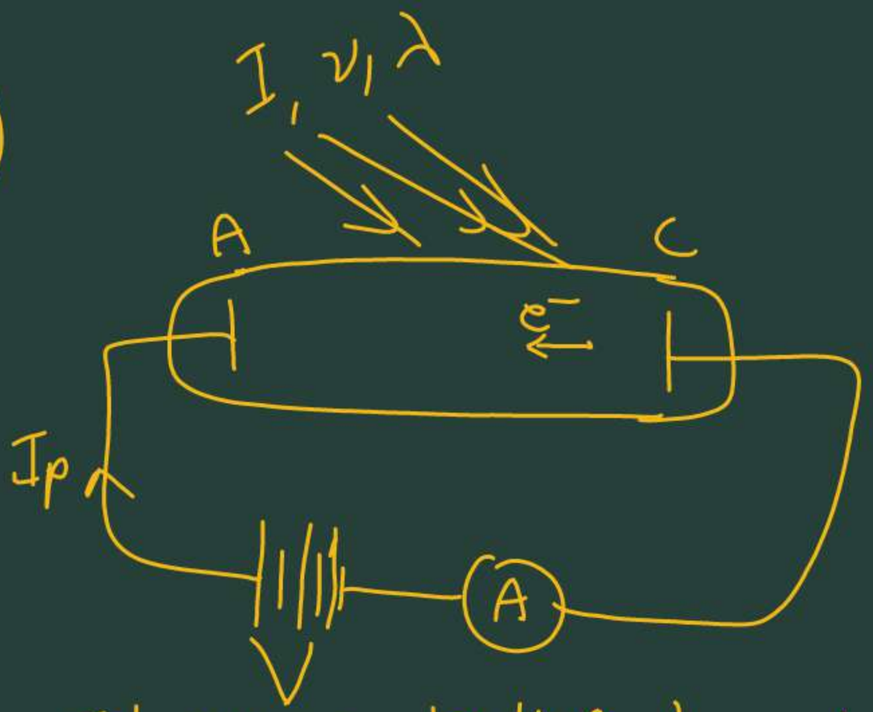
λ_0 → threshold wavelength

I_p V/s Voltage (intensity)

① $I \rightarrow$ const.

ν, λ





Stopping potential depends upon the max^m KE of e^- @ cathode.

→ ν of light