The slope of the given curve (from experiment) is determined and is compared to the slope $\left(h/e\right)$ – as suggested by Einstein's equation (1), and value of plank's constant is determined.

i.e., $\quad slope = \dfrac{\Delta V_s}{\Delta f} = \dfrac{h}{e}$

or $\quad \boldsymbol{h = slope \times e.}$

The same experiment is repeated for other alkali metals (Lithium, Potassium metals), and the value of Plank's constant is determined. The value of Plank's constant thus determined is found to be $6.26 \times 10^{-34}\ Js$, which is very close to the value suggested by Max Plank ($h = 6.62 \times 10^{-34} Js$).

This very close (say, accurate) determination of plank's constant verifies the correctness of Einstein's Photoelectric Equation.

Note: <u>Graph Analysis</u>:

KE_{max} in eV
OR
V_s in Volt

V_2

$Slope = \dfrac{h}{e} = \dfrac{V_2 - V_1}{f_2 - f_1}$

$\therefore h = slope \times e$

V_1

f

$f_o \quad f_1 \qquad f_2$

$\boldsymbol{y - intercept = -\dfrac{\phi}{e}}$

Threshold Frequency

$V_s = \dfrac{h}{e} f - \dfrac{\Phi}{e}$
$y = mx + c$

KE_{max} in Joule

KE_2

$Slope = h = \dfrac{KE_2 - KE_1}{f_2 - f_1}$

$\therefore h = slope$

KE_1

f

$f_o \quad f_1 \qquad f_2$

$\boldsymbol{y - intercept = -\phi}$

Threshold Frequency

$KE_{max} = hf - \Phi$
$y = mx + c$