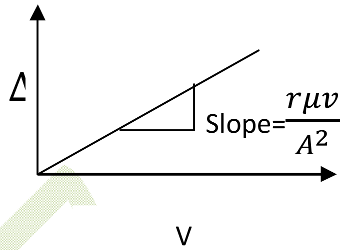
Two important types of operation will now be considered :

i) For a filtration at const . (rate)

$$\frac{dV}{dt} = \frac{V}{t} = const.$$

So that



$$\frac{V}{t} = \frac{A^2 \Delta p}{r\mu v V}$$

i.e.

$$\frac{t}{V} \; \frac{r\mu v}{A^2 \Delta p} V$$

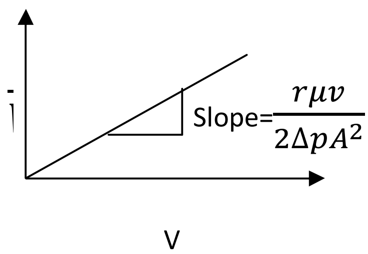
OR $\Delta p = \frac{r\mu v}{A^2}\left(\frac{V}{t}\right) V$

ii) For a filtration at const. press. Difference

$$\frac{dV}{dt} = \frac{A^2 \Delta p}{r\mu v V} \rightarrow \int_0^V V dV = \frac{A^2 \Delta p}{r\mu v} \int_0^t dt$$

$$\frac{t}{V} \; \frac{r\mu v}{2A^2 \Delta p} V$$

Thus for a const. press. Filtration , there is a linear relation between (V^2) and (t) or between (t/V) and (V) .



Filtration at constant pressure is more frequently adopted in practice, although the pressure difference is normally gradually built up to its ultimate value. If this takes a time (t) during which a volume (V) of filtrate passes, then integration