

## How do I calculate plug length in Capillary Electrophoresis?

One possible way is to use the "Poiseuille equation" to calculate the plug length:

$$V = (\Delta P d^4 \pi t) / (128 \eta L)$$

where  $V$  is volume of the injected plug,  $\Delta P$  is pressure drop down the length of the capillary (pascals),  $d$  is the inside diameter (m),  $\eta$  is the fluid viscosity (Pascal-sec),  $t$  is time the pressure is applied (sec), and  $L$  is the length of the capillary (m). Here you solve for  $V$  to get the injected plug volume. From there, you simply use the cylinder volume equation to convert volume to length of the plug:

$$V = \pi r^2 L_{\text{plug}}$$

$$L_{\text{plug}} = (V / (\pi r^2))$$

$$L_{\text{plug}} = (V / (\pi (d/2)^2))0$$



where  $r$  is the inside radius and  $L_{\text{plug}}$  is the length of the plug.

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