

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, ΔP is pressure drop down the length of the capillary (pascals), d is the inside diameter (m), η 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_{plug} is the length of the plug.

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MicroSolv Technology Corporation

9158 Industrial Blvd. NE, Leland, NC 28451

tel. (732) 380-8900, fax (910) 769-9435

Email: customers@mtc-usa.com

Website: www.mtc-usa.com

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