

## Perform an Ohms Law Plot – How to

**Ohm's Law Plot to Optimize your Separation can bring many benefits and is essential for good CE Methods.**

- Select the optimal voltage setting for your separation.
- Maximize the efficiency of your method.
- Learn the upper voltage limits of your method.
- Use to validate your capillaries in your method.

Performing an Ohm's Law Plot or current/voltage plot is very simple. The optimal voltage is a function capillary diameter, capillary length, background electrolyte (BGE) concentration, BGE ionic mobilities, and the temperature of your system and efficiency of your cooling system.

The point at which there is a positive Deviation from **Linearity** of this plot is the Maximum Voltage you should use with the conditions you tested under.

To Perform an Ohm's Law Plot:

1. Fill your Capillary with a **Buffer** or BGE that you will use in your Method.
2. Set the Instrument Temperature to the temperature in your Method.
3. Set the voltage to 1-2kV.
4. Activate and record the Current.
5. Increase the Voltage in 1-5kV increments. Record the current once it stabilizes each time.
6. Enter the Data in a spreadsheet program and perform a plot of Current V. Voltage
7. Use Voltage as the X-axis.
8. Determine when a 5% Positive Deviation from **Linearity** occurs.
9. This is the OPTIMAL Voltage to run at.

*If you change any experimental conditions you should re-run the above Ohm's Law Plot.*

*This Ohm's Law Plot shows the difference between two different instruments with two different cooling systems. Plot A, uses an air-cooled temperature control system and Plot B, uses a liquid cooled system. Capillaries and buffers were the same. It is obvious by this graph that a liquid cooled system is more efficient and provides a greater capability. It does bring in other factors such as cost and is a little less easy to use.*

[Click HERE for The MicroSolv CE Primer](#)

Printed from the Chrom Resource Center

**MicroSolv Technology Corporation**

9158 Industrial Blvd. NE, Leland, NC 28451

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

Email: [customers@mtc-usa.com](mailto:customers@mtc-usa.com)

Website: [www.mtc-usa.com](http://www.mtc-usa.com)

Date: 04-05-2024