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 L**inearity** of this plot is the Maximum Voltage you should use with the conditions you tested under.

To Perform and Ohm's Law Plot:

1. Fill your Capillary with a B**uffer** 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 L**inearity** 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

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