

Waters 2424 ELSD Tips and Techniques

Don't:

1. Use temperature and gas settings from any other model/brand of ELSD. Use the general recommendations below as a starting point in the absence of specific 2424 settings for your application.
2. Pump liquid into the detector w/o gas flow and Drift Tube (DT) Temperature on
Allow ~15min at Power-Up for DT to heat up before pumping into the detector
3. Let black exhaust hose do anything other than hang straight down
4. Vent detector where a vacuum is drawn directly on the black hose

General Conditions:

Nebulizer Power: OFF (except normal phase apps, then ~30%?) The more power you apply the hotter the nebulizer gets, the more effluent you send into the DT. The more you put in the drift tube the more you have to detect but the more solvent you have to dry down to prevent noise or spiking.

Drift Tube Temperature: 48 to 55°C depending upon % aqueous. When changing temperatures, allow ~15 mins for DT temp. to stabilize. The hotter you make it the better the baseline gets as spiking and noise decreases due to the desolvation of the droplets. Unfortunately, as the DT temperature gets hotter, the analyte volatilizes along with the mobile phase and you get reduced sensitivity or no peaks at all. Good starting point: 50°C

Gas: 40-50 psi, optimize in 2 psi increments for best signal-to-noise. The higher the pressure the more gas there is to dry down the mobile phase and the less noise there is in the baseline. Unfortunately, the faster the flow, the faster the peaks pass the detector and the lower the response gets. The signal-to-noise usually reaches a "plateau" through the 40-50 psi range. Good starting point: 50psi

Gain: 1000

Time Constant: 1 sec., 2pts/sec. Adjusting up or down can improve signal to noise but watch out for loss of resolution as you increase this value.

If You See:

1. **Spiking Or Excessive Noise**, especially early in a RP gradient. You are likely not evaporating enough solvent to form dry particles.
 - a. Turn off the Nebulizer power
 - b. Increase Drift Tube temperature in 2°C increments until it stops (usually not past 55°C)
 - c. If you get to 55°C on the Drift tube and still have spiking, increase the gas flow in 2psi increments until it stops (usually not past ~50psi)
2. **No Analyte Peak** You may be volatilizing the analyte along with the mobile phase. Drop drift tube temperature in 2°C increments until you see peaks. If spiking starts before analyte appears, stop lowering DT temperature and...
 - a. Increase power to the nebulizer, putting more effluent into the DT or
 - b. Inject greater mass of sample, or
 - c. Decrease gas flow in 2psi increments (the noise will get worse and eventually unusable at a pressure determined by the %aqueous in the mobile phase)
 - d. You may also consider decreasing the flow rate which will allow for lower drift tube temperatures and increasing the sensitivity of the semi-volatile compounds at the cost of increasing the analysis time.