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Micro LC columns offer chromatographers the opportunity to improve sensitivity or use lower flow rates due to their smaller internal diameter. The downside to reduced column diameter is in order to maximize efficiency, sources of band broadening need to be minimized and sample preparation is critical to improve column lifetime.

See below for tips on how to improve your micro LC column's performance over time and how to prevent long lasting damage.

### **Sample Preparation**

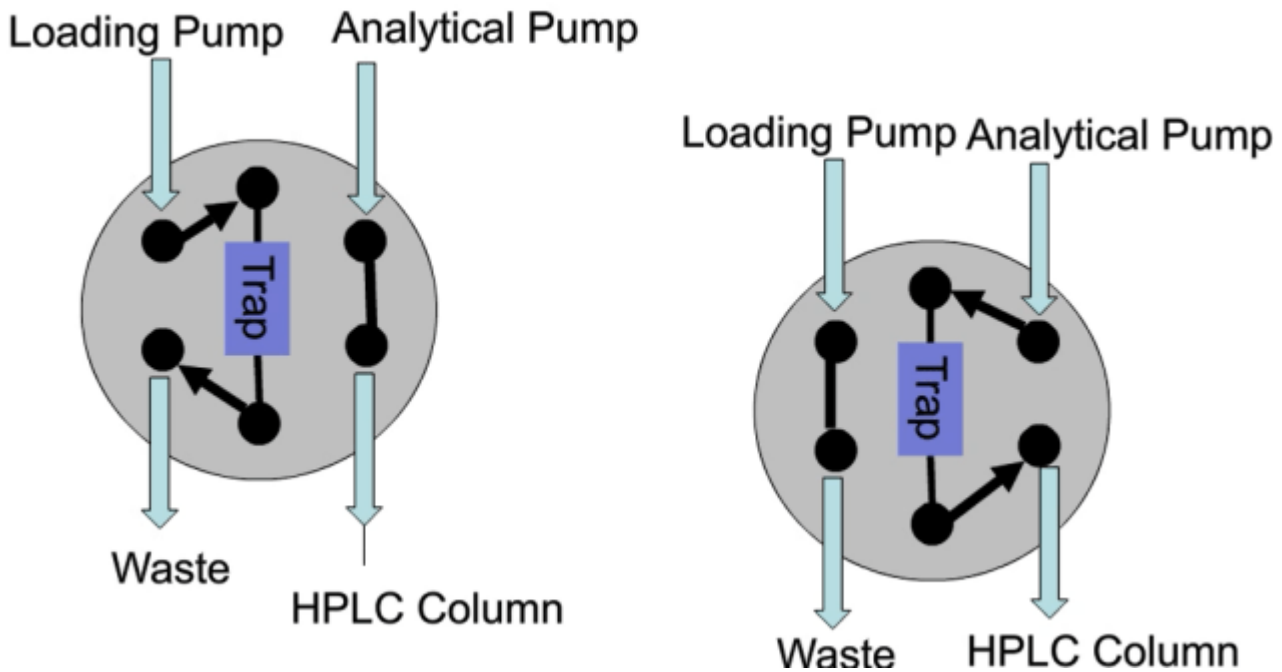
- Using a trap and elute format will provide cleaner samples for injection on to the analytical column and improve column lifetime
- Utilizing sample preparation techniques such as solid phase extraction (Strata-X SPE products) or accessories (Phenex Syringe Filters) to minimize the injection of unwanted contaminants onto your system and column can also prolong column lifetime

### **Trap Configuration**

Phase selectivity and direction of mobile phase flow onto and off the trap column will all contribute to column efficiency and lifetime. The choice of an appropriate stationary phase for your trap will help to improve separation whereas direction of flow during your trap and elute method can improve column lifetime by minimizing particulate build up when used in the forward direction.

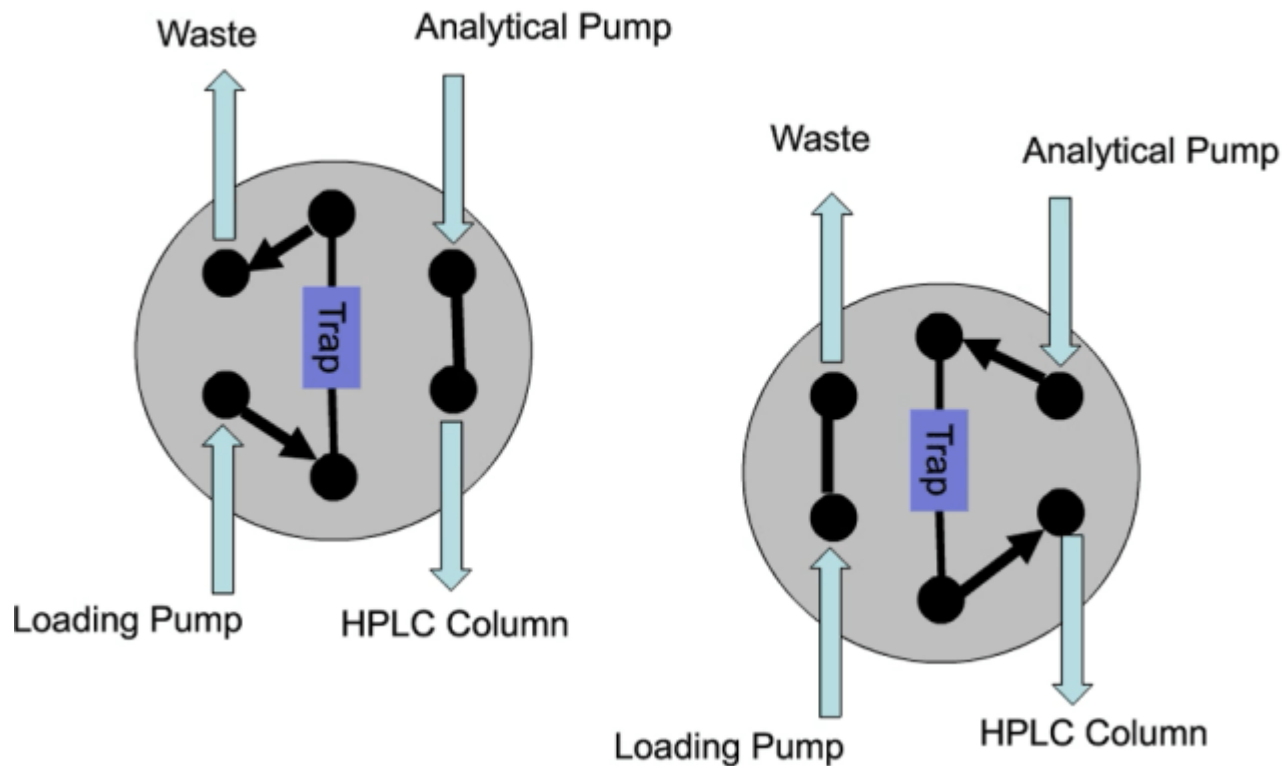
### **Forward Elute**

In the forward direction your injection loads the sample onto the trap in the forward direction, while this is still pumping to waste you can here carry out a washing step if you wish so. Once you alter the trap valve the sample is pumped from the trap column onto the analytical column. With forward elution the sample has to pass all the way through the trap column to reach the analytical column and the stationary phase in this trap column is more impactful on separation than in the reverse elute mode. It also means any insoluble matter stays trapped on this column and your Micro LC column is much better protected.



### Reverse Flow

With reverse elute the sample is loaded and washed in the same way but now when we switch the valve the gradient is pumped in the reverse direction eluting the sample back off the trap in the same direction it was loaded onto it. This makes the packing material less important in terms of overall selectivity as the flow path is shorter but it also means insoluble matter has the potential to be flushed back out of the trap and into your Micro LC column. In the reverse direction you can also benefit from using a wider ID trap; which can be loaded at a faster flow rate; accelerating this step if you have a time sensitive application.



## Typical Flow Rates

- For 1mm ID columns typical flow rate is 1-75 $\mu$ L/min

**Loading** Typical Sample Load 1-10 $\mu$ g

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For more resources regarding Micro LC or the prime products to use for your analysis, visit

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## Technical Tip - How to Improve Your Micro LC Column's Performance

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