

Column efficiency is a balance of trying to run your methods at a fast speed, without compromising separation quality. When an HPLC analysis is run quickly, you have more time to run more methods, ultimately saving on system downtime and costs overall.

Fortunately, there are three simple ways to increase the speed of a HPLC method, while maintaining high-quality results.

These include the following:

HPLC Column Length

This is probably the easiest way to increase the speed of your method. The shorter the HPLC column, the shorter the runtime, meaning it is possible to run more samples through the column faster. However, the shorter the column length is, the lower the peak resolution. For this reason, it is vitally important to balance the length of the column with the resolution to ensure optimal results.

Fortunately, it is possible to maintain resolution, even when the column length is reduced. The key is to ensure the needs of the analysis are met, the main peaks are separated and that the appropriate high efficiency particle is selected to obtain this.

Particle Size

The smaller the size of the stationary phase particles, the more efficient and sensitive the U/HPLC column is. Keep in mind that the smaller the particle size, the higher the backpressure in the system will be, so again, this means finding a balance between what separation you need to accomplish and the particle size, column length, and backpressure that is being selected for that separation.

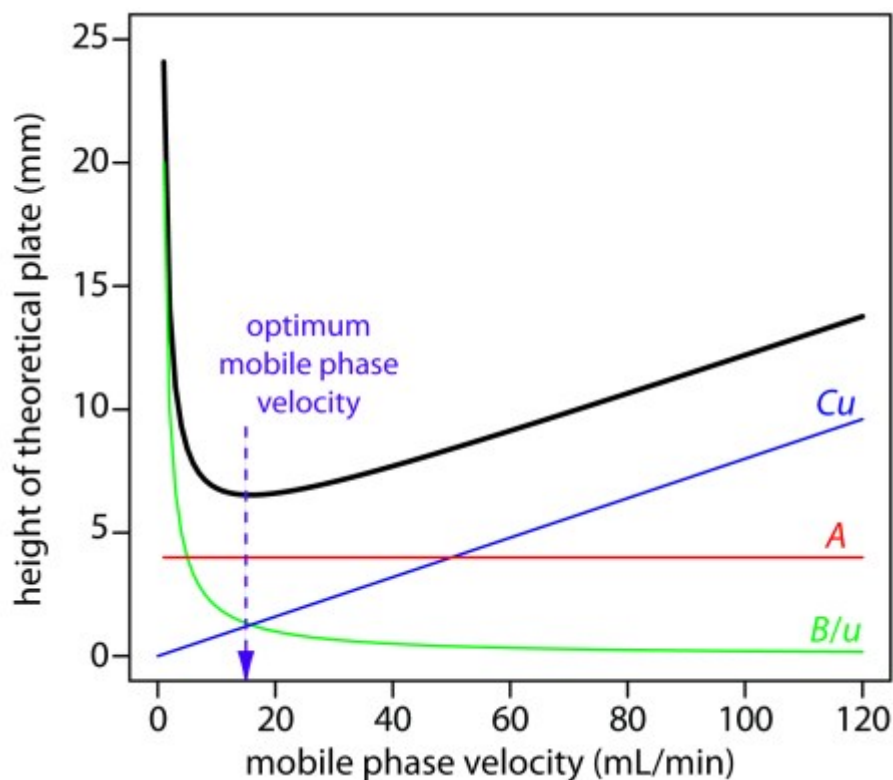
One way to directly address the increase in pressure in the HPLC system is to use core-shell particles. These particles are made up of a solid core that is surrounded by an outer shell that is high in porosity. These work the same as small particles to increase system efficiency and speed, without raising system pressure.

Mobile Phase Flow Rate

The final way to increase the speed of your HPLC method is to increase the flow rate of the mobile phase. When the mobile phase flow rate is increased, the analytes move through the column faster, making the analysis time quicker.

Again, since an increase in flow rate can reduce the efficiency of the column, it is important to determine the optimal flow rate to increase the speed of the system, without compromising column efficiency. This can be done by plotting flow rate and column

efficiency on a Van Deemter graph.



Ultimately, when the speed of the HPLC analysis is increased, more samples can be run during the course of a day, which increases overall lab productivity. The key is not to sacrifice column efficiency or peak resolution in the name of speed, but to carefully balance column length, particle size, and mobile phase flow rate.

If you have any questions about the speed of your HPLC system or require technical assistance with your work, chat with our free, 24/7, online Technical Support service - **Chat Now**.

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