

Driving Performance in Your HPLC or LC-MS Workflow

Streamline your separations and
optimize output by enhancing every step
of your HPLC, UHPLC or LC-MS
method development

*Please click
the circles
to navigate*



HPLC
WORKFLOW
SOLUTION

MOBILE
PHASE
PREPARATION

SAMPLE
PREPARATION

METHOD
DEVELOPMENT

INSTRUMENTS
AND
SOFTWARE

SERVICES





HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

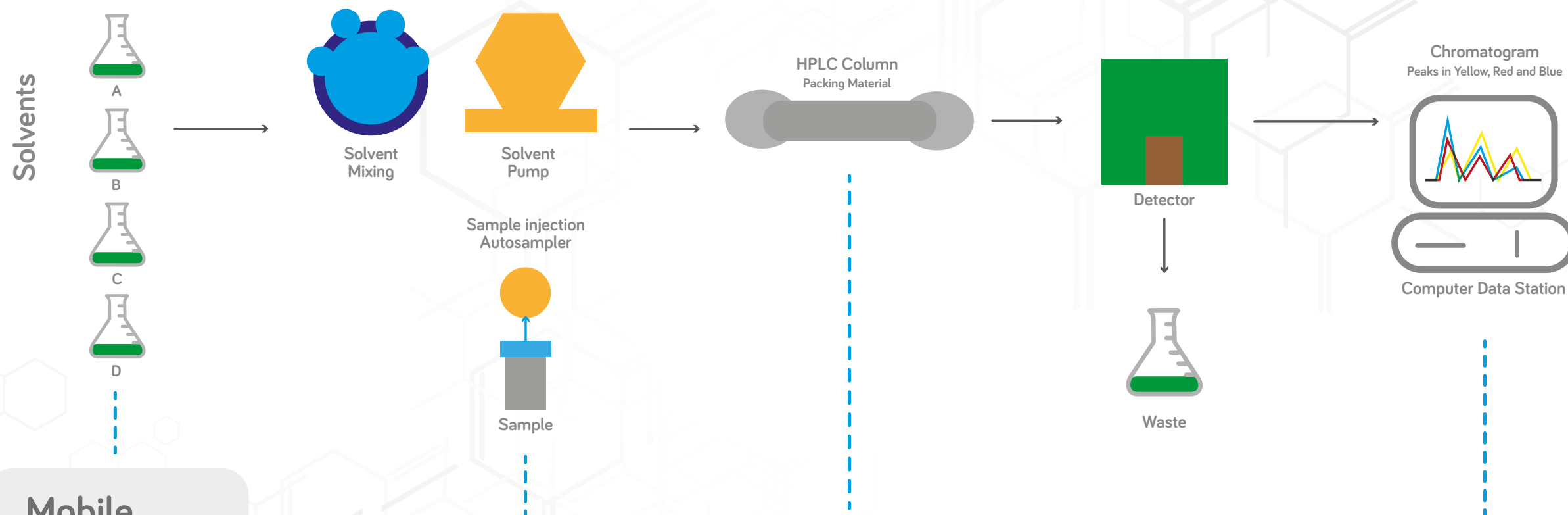
SAMPLE
PREPARATION

METHOD
DEVELOPMENT

INSTRUMENTS AND
SOFTWARE

SERVICES

Many factors in HPLC and LC-MS workflows can impact analysis. Considering the effects of the whole workflow affords improved control of analysis robustness and accuracy. Here, we systematically discuss the factors central to developing methods both efficiently and reproducibly.



Mobile
Phase
Preparation

Sample Preparation

Column Selection

Instruments and Software

LINKS



Visit our
Chromatography
solutions site

Sponsored by



Produced by

the Analytical Scientist





HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

SAMPLE
PREPARATION

METHOD
DEVELOPMENT

INSTRUMENTS AND
SOFTWARE

SERVICES

Mobile Phase Preparation

Mobile phase preparation is vital to the performance of HPLC and LC-MS workflows

There are several factors that can harm analysis, such as contamination from the HPLC system or use of low-quality consumables and reagents; these can cause ghost peaks and introduce impurities, ruining your HPLC or UHPLC analyses.

Ghost peaks are problematic because these non-identified peaks can lie close to, or even overlap with, peaks of interest. Uncertainty in data quality and reliability is of course the result.

Particulates introduced during the incorrect preparation of mobile phases can lead to poor peak shape, cause the appearance of additional peaks, and can also block the HPLC system, causing costly delays.

Improperly prepared buffers or buffers of the wrong concentration can also cause problems. Incorrect preparation can affect retention times, and increase the level of baseline noise in your sensitive HPLC or UHPLC runs.

Controlling all of these parameters is an important but simple way to improve performance. Here, we discuss solvent quality, buffer preparation and mobile phase filtration.

Filter your sample
efficiently and
accurately
with Solvac.

Solvent quality - a guarantee to avoid ghost peaks in gradient HPLC

In many industries, 'control' is essential in production and analysis. One of the most common methods used is reversed-phase HPLC or UHPLC. However, there are several factors that can harm your analysis such as contamination from the HPLC system or using low quality consumables and reagents. These factors can cause ghost peaks, introduce impurities and ruin your HPLC or UHPLC analyses. Quality and batch-to-batch solvent reproducibility are one of the key parameters to avoid poor quality results.

Solvent quality - a
guarantee to avoid ghost
peaks in gradient HPLC

Why is pH so important in buffers and additives in reversed-phase HPLC or LC-MS?

When samples contain ionisable compounds, mobile phase pH can be one of the most important variables in the control of retention in a reversed-phase HPLC (RP-HPLC) separation. However, if it is not controlled properly, pH can be a source of many problems. Since most compounds analysed by RP-HPLC contain one or more acidic or basic functional groups, most mobile phases require pH control. For this reason, buffers are widely used.

Why is pH so important
in buffers and additives in
reverse-phase HPLC or
LC-MS?

The power of intelligent
digital electrodes in meeting
GLP requirements for
quality control applications

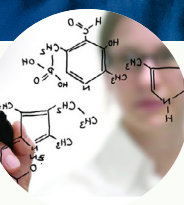


The power of intelligent
digital electrodes in meeting
GLP requirements for quality
control applications

LINKS



Visit our
Chromatography
solutions site



Solvents from
VWR

Sponsored by



Produced by

the
Analytical Scientist





HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

SAMPLE
PREPARATION

METHOD
DEVELOPMENT

INSTRUMENTS AND
SOFTWARE

SERVICES

Analytical Sample Preparation

The importance of sample filtration

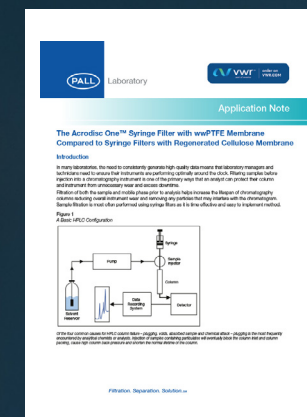
In many laboratories, the need to consistently generate high-quality data means that laboratory managers and technicians need to ensure their instruments are performing optimally around the clock. Filtering samples before injection into a chromatography instrument is one of the primary ways that an analyst can protect their column and instrument from unnecessary wear and excess downtime. Filtration of both the sample and mobile phase prior to analysis helps increase the lifespan of chromatography columns, reducing overall instrument wear and removing any particles that may interfere with the chromatogram. Sample filtration is most often performed using syringe filters as it is a time-effective and easy-to-use method.

By choosing the correct syringe filter, such as the Universal wwPTFE from Pall Laboratory, you can lower the risk of poor results, as is discussed in this paper.

Get the right
vials for your
analysis



Acrodisc™ Syringe Filters
for analytical sample
preparation



The Acrodisc One™ Syringe
Filter with wwPTFE Membrane
compared to Syringe Filters
with regenerated cellulose
membrane

LINKS



Visit our
Chromatography
solutions site



Pall Analytical
Sample Preparation

Sponsored by



Produced by

the
Analytical Scientist





HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

SAMPLE
PREPARATION

METHOD
DEVELOPMENT

INSTRUMENTS AND
SOFTWARE

SERVICES

Sample Prep with Avantor SPE

For as long as scientists have been analyzing compounds, there has been a need for sample preparation to extract and purify sample components.

Today's technology for sample preparation, solid phase extraction (SPE), is grounded in the principles of chromatography and offers increased speed, reduced hazardous solvent use and exposure, and improved reproducibility of the separation when compared to other wet chemistry methods, such as liquid/liquid extraction. Our scientists have been using and perfecting this method in our research and development labs since the 1970s.

The purpose of sample preparation is twofold:

- Sample clean up – necessary to eliminate impurities and/or isolate the component of interest from the matrix. This helps to increase the lifetime of the analytical column and prevents contamination of equipment, thereby protecting expensive instrumentation.
- Sample concentration – in order to reach the detection limits of the analytical equipment. Sample preparation selectively concentrates the components of interest prior to analysis.



Solid phase extraction
products

LINKS



Visit our
Chromatography
solutions site



BAKERBOND™
Solid Phase Extraction
products

Sponsored by



Produced by

the
Analytical Scientist



HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

SAMPLE
PREPARATION

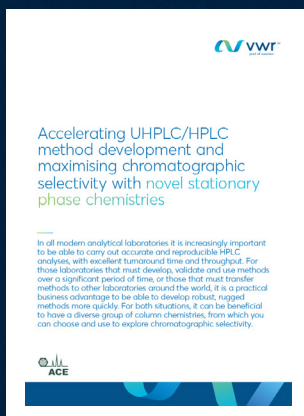
METHOD
DEVELOPMENT

INSTRUMENTS AND
SOFTWARE

SERVICES

Accelerating UHPLC/HPLC Method Development and Maximizing Chromatographic Selectivity with Novel Stationary Phase Chemistries

Accurate and reproducible HPLC analyses with excellent turnaround time and throughput are increasingly important in modern analytical laboratories. For those laboratories that must develop, validate and use methods over a significant period of time, or those that must transfer methods to other laboratories around the world, it is a practical business advantage to be able to develop robust methods more quickly. For both situations, it can be beneficial to have a diverse group of column chemistries, from which you can choose and use to explore chromatographic selectivity.



Accelerating UHPLC/HPLC method development and maximizing chromatographic selectivity with novel stationary phase chemistries



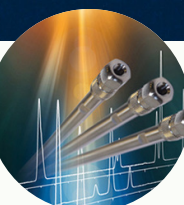
The power of stationary phase selectivity



Webinar
A UHPLC/HPLC method development strategy with complementary stationary phases to maximise selectivity and resolution



Visit our
Chromatography
solutions site



ACE UHPLC
and HPLC Columns



Sponsored by



order on
VWR.COM

Produced by

the
Analytical Scientist



HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

SAMPLE
PREPARATION

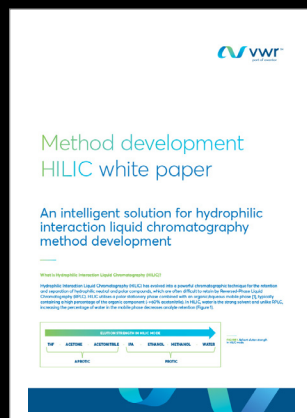
METHOD
DEVELOPMENT

INSTRUMENTS AND
SOFTWARE

SERVICES

An Intelligent Solution for Hydrophilic Interaction Liquid Chromatography Method Development

Efficient method development procedures require a logical exploration of key chromatographic parameters, leading to a robust method using a suitable combination of column and mobile phase. Rationally designed method development procedures assess key parameters that affect chromatographic selectivity (e.g. stationary phase, pH etc.) and enable analysts to make informed decisions whilst reducing the risk of developing sub-standard, non-robust methods. By following a step-by-step process, method development can be streamlined thereby and laboratory productivity increased. The approach outlined here is based on a logical assessment of the most powerful parameters affecting HILIC selectivity.



Method development
HILIC white paper



A simple step-by-step
protocol for HILIC method
development



Webinar

How to improve method
development strategies in HILIC
conditions?

LINKS



Visit our
Chromatography
solutions site



ACE UHPLC
and HPLC Columns

Sponsored by



Produced by

the
Analytical Scientist



HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

SAMPLE
PREPARATION

METHOD
DEVELOPMENT

INSTRUMENTS AND
SOFTWARE

SERVICES

Gradient Method Translation Using the ACE LC Translator

Translating gradient LC methods from one column dimension to another is common, but maintaining the separation selectivity and peak resolution can be challenging. For the most reliable translation of gradient methods between column formats, careful consideration of fundamental chromatographic principles is required. Omitting key parameters in calculations can lead to detrimental changes in selectivity or peak resolution of the translated gradient method. The ACE LC Translator is based upon fundamental principles and includes all key parameters and calculations required for an accurate gradient method translation process.



Using the ACE LC Translator

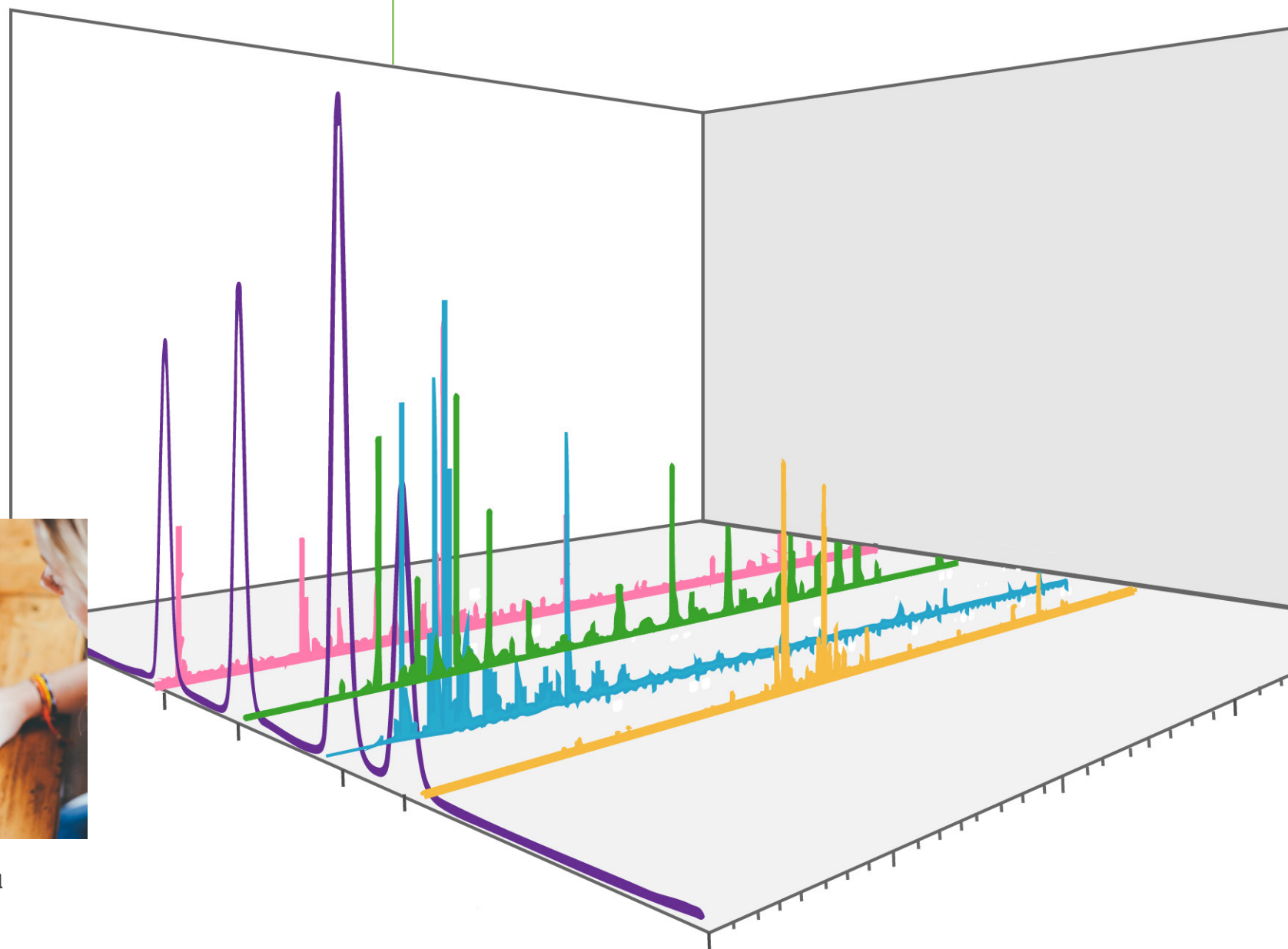


Webinar

Practical UHPLC: selectivity
and rapid method development,
method translations and
instrument transfers



Download the tool



LINKS



Visit our
Chromatography
solutions site



ACE UHPLC
and HPLC Columns

Sponsored by



Produced by

the Analytical Scientist





HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

SAMPLE
PREPARATION

METHOD
DEVELOPMENT

INSTRUMENTS AND
SOFTWARE

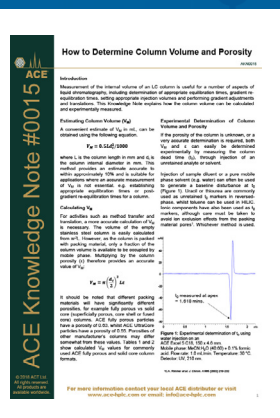
SERVICES

Tips and Tricks

There are many calculations that need to be done in HPLC depending on your analysis needs. We discuss some of the common considerations and give you a tool to help you calculate them to make your HPLC/UHPLC more efficient.



How to determine extra column dispersion and extra column volume



How to determine column volume and porosity



How to determine system dwell volume: theory and practice



Download the tool

LINKS



Visit our
Chromatography
solutions site



ACE UHPLC
and HPLC Columns

Sponsored by



order on
VWR.COM

Produced by

the
Analytical Scientist



HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

SAMPLE
PREPARATION

METHOD
DEVELOPMENT

INSTRUMENTS AND
SOFTWARE

SERVICES

Computer-aided Method Development Using In-silico Computer Modelling and Six Columns with Unique Selectivities

Reversed-phase method development can be a lengthy process that consumes valuable resources in an analytical laboratory. The process followed and success obtained can vary depending upon experience, resources and time available. Often, a trial-and-error (or one factor at a time) approach is adopted, where parameters are adjusted and decisions made according to the analytical results obtained for each iterative step. This approach can produce acceptable separations but may fail to identify the most suitable method; in other words, the most robust or cost-effective methods. A structured approach to method development is helpful for many reasons: it can lead to the development of improved and more robust methods, generate useful retention knowledge for analytes, and has the potential to provide significant savings regarding both development time and costs. A popular approach is to use screening protocols to systematically explore individual chromatographic parameters (such as column stationary phase, eluent composition, pH, and so on) and their effects on retention/separation. Once screening is complete, the most promising combination of conditions can be further optimized, if needed, to produce the final method. This approach is useful, informed and highly recommended.

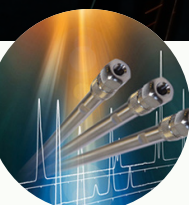


Computer-aided method development using *in-silico* computer modelling and 6 columns with unique selectivities

LINKS



Visit our
Chromatography
solutions site



ACE UHPLC
and HPLC Columns

Sponsored by



Produced by

the
Analytical Scientist



HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

SAMPLE
PREPARATION

METHOD
DEVELOPMENT

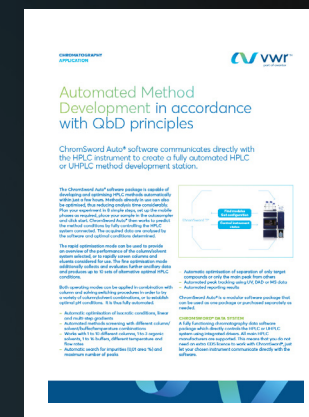
INSTRUMENTS AND
SOFTWARE

SERVICES

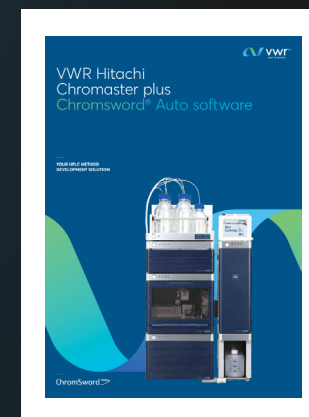
Automated Method Development in Accordance with QbD Principles

The Chromsword Auto® software package is capable of developing and optimizing HPLC methods automatically in just a few hours. Methods already in use can also be optimized, thus reducing analysis time considerably. Plan your experiment in eight simple steps, set up the mobile phases as required, place your sample in the autosampler and click "start". Chromsword Auto® then works to predict the method conditions by fully controlling the HPLC system connected. The acquired data are analyzed by the software and optimal conditions determined.

The rapid optimization mode can be used to provide an overview of the performance of the column/solvent system selected, or to rapidly screen columns and eluents considered for use. The fine optimization mode also collects and evaluates further ancillary data and produces up to ten sets of alternative optimal HPLC conditions.



Automated Method Development in Accordance with QbD Principles



VWR Hitachi Chromaster plus Chromsword® Auto software

LINKS



Visit our
Chromatography
solutions site



VWR Hitachi HPLC/
UHPLC Systems

Sponsored by



order on
VWR.COM

Produced by

the
Analytical Scientist





HPLC WORKFLOW
SOLUTION

MOBILE PHASE
PREPARATION

SAMPLE
PREPARATION

METHOD
DEVELOPMENT

INSTRUMENTS AND
SOFTWARE

SERVICES

Case Study

Science as a service accelerates innovation in the lab of the future

A leading global pharmaceutical company needed to find new ways to help their scientists focus more time and attention on innovation and strategic drug project work.

Maintaining cell lines, performing QC assays, and doing routine chromatography were consuming a large portion of scientific time.

Through a series of workshops and analyses, these medium-complexity tasks were identified as key opportunity areas where substantial time savings could be realized.

Re-capturing this time to focus on patent-generating science and innovation would require an increased focus on operational efficiency and standardization of routine laboratory tasks.

Find out how Avantor Services tackled the challenge

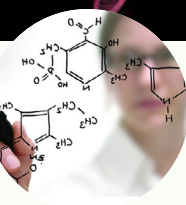


Success story

LINKS



Visit our
Chromatography
solutions site



Avantor
Services

Sponsored by



Produced by

the
Analytical Scientist