

## TRAINING COURSE

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# How to Troubleshoot HPLC

Learn how to find solutions for problems encountered when running HPLC analysis by diagnosing symptoms and implementing appropriate preventative measures. This one day training course is ideal for those who have experience of using HPLC and now want to develop their skills further.

The course will enable you to go back to your lab with a full understanding of why problems may arise with your HPLC system and give you the skills and knowledge to both prevent and resolve those problems. In addition you will be able to:

- Understand how HPLC works and the role of each component in a HPLC system.
- Understand how problems can arise in the individual components of a HPLC system.
- Implement measures which prevent problems occurring.
- Use a systematic problem-solving approach to HPLC troubleshooting.
- Diagnose and resolve problems associated with HPLC.

This course is available in two options: You can attend one of our open enrolment training courses at an external location (dates of upcoming events are available on the MTS website); or we can deliver the course at your site. On-site training allows customisation to meet your specific requirements, this may include a practical 'hands-on' session using the HPLC instruments in the customer laboratory.

Comprehensive course handout, access to training resources via e-MTS, certificate of training and post training support are all included in the course fees.

## Course Outline

### Overview of the HPLC system and how it works:

**Mobile phase** – Solvents used for HPLC; strong and weak solvents for reversed phase and normal phase HPLC; use of buffers in mobile phase and the importance of pH control; isocratic and gradient mobile phase methods; preparation of mobile phases; premixing and online mixing compared.

**Mobile phase mixers** – Low pressure and high pressure systems.

**Vacuum degasser** – Mode of operation.

**Pumps** – Reciprocating single piston pump design; pump seals and check valves; typical pump pressures and flow rates.

**Injectors** – Preparation of test solutions; vials used for HPLC; six port injection valve design; typical injection volumes.

**Columns** – Parameters used to describe columns, e.g. bonded phase, particle size, dimensions, etc.; Compression fittings for connecting columns and other parts of the HPLC system; guard columns and cartridges.

**Detectors** – Detection techniques are reviewed with emphasis on UV detection.

**Common problems & preventative measures:**

This course includes exercises for each of the sections above in which potential problems are identified and preventative measures discussed.

**Problem solving strategy:**

Assessing the symptoms, making a diagnosis & finding the appropriate solution

A set of symptoms of HPLC problems are derived from a review of the procedures involved in performing an HPLC analysis, thus providing a logical set of categories to enable diagnosis and finding a solution. The categories of symptoms are: system errors, leaks, pressure related problems, baseline problems, changes in chromatography and quantification problems. Each category of symptoms is discussed in detail, and then a series of 15 case study problems provide an opportunity to apply the problem solving strategy.