

**Sample preparation** may feel like a basic, routine task, but it lies at the core of your HPLC analyses. Running robust, accurate, and good analytical methods for HPLC and GC analysis relies greatly on good sample preparation. With this in mind, we will discuss the advantages of good sample preparation, but first, it is important to know the basics of proper sample preparation.

## Proper Sample Preparation

A well-prepared sample requires the following:

### **Ensure all chemicals, reagents, and samples are handled properly**

The samples should be handled with absolute precision and care from the very moment they enter the lab, ensuring that they remain intact and are preserved from contamination.

Therefore, all chemicals, reagents, and samples should be handled carefully using methods that will prevent any contamination. An example is drawing out solvents from solvent bottles, it is a best practice to avoid using pipette which can be a point of contamination in the whole solvent bottle, instead pour the solvent directly in to a beaker from the bottle.

### **Choose the glassware and solvents that best suit the needs of the method**

Choosing the right glassware for sample preparation includes choosing volumetric flasks and pipettes that have higher tolerances and accuracy. Ensure the glassware is in good condition and that the volume markings are intact and clearly visible, to avoid any manual measurement errors.



### **Avoid mixing solvents in a volumetric flask**

When mixing aqueous and non-aqueous solvents, their volumes can change. If you mix them in a volumetric flask, you may end up with an incorrect volume. Instead, it is better to mix the solvents in another beaker or flask and then measure out the correct volume using the

volumetric flask.

## **Use sample preparation techniques that are based on the concepts of kinetics and equilibrium**

Precision is the key. Ensure that all samples are subjected to exactly the **same sample preparation techniques**. For example, each sample should be shaken long enough for partitioning to happen, then it must be left long enough to settle into equilibrium within each phase. A mechanical shaker is the best way to do this, as this introduces consistency in sample preparation.

With this in mind, any sample preparation technique should be done with absolute precision. This includes **QuEChERS, solid-phase extraction (SPE), solid-liquid-extraction (SLE), protein precipitation (PPT)**, liquid-liquid extractions (LLE), and head space analysis.

## **Advantages of Proper Sample Preparation**

While the above guidelines for sample preparation seem basic, they are critical when it comes to achieving reproducibility, selectivity, and sensitivity.

- **Reproducibility** – When samples are properly prepared it will be consistent, measurable, and repeatable. This means you can conduct multiple analyses and you will be able to reproduce the same results every time.
- **Selectivity** – Following the above sample preparation guidelines will increase the selectivity of your sample mixtures, ensuring you can identify and separate specific analytes without interference from sample matrix components.
- **Sensitivity** – When the sample is properly prepared contaminants that cause ion suppression are removed from the sample, improving signal-to-noise ratio, and leading to higher sensitivity for analyte detection.

If you would like more information about proper HPLC sample preparation and its benefits, contact one of our technical specialists through our free online portal – **Chat Now**

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