10 REASONS THAT THE ZETASIZER NANO IS CHOSEN FOR SCIENTIFIC SUCCESS

Abstract:

New components and measurement techniques continue to be introduced for the Zetasizer Nano. New to the system are a Surface Zeta Potential accessory and a new diffusion barrier method for improved zeta potential measurements of protein samples.

Why is the Malvern Zetasizer Nano so popular and found in a broad range of applied and fundamental scientific projects across all industries and fields?

Because, it is simply the most dynamic and broad ranged instrument on the market for solving technical issues in today's research environment and it continues to evolve with new capabilities.

Here are 10 reasons why you should choose the Zetasizer Nano:

1. Measurement of the zeta potential of a solid surface with the new Surface Zeta Potential Cell.

It is now possible to obtain zeta potential measurement of a solid surface using a newly designed cell for the Zetasizer Nano Instrument.

This will allow researchers to study the surface of a material and adsorption or desorption processes from that surface. The results will provide information about coating surfaces and the interface of a material. Therefore, it is possible to modify the chemistry of a material substrate and obtain results about the surface activity of surfactants or other formulation materials onto a solid surface.

2. Measurement of protein samples with a new Diffusion Barrier Method for highly improved results without damaging the protein structure.

This measurement method uses the standard disposable/reusable capillary zeta potential cells. A cell is filled with the same buffer which is used as the dispersing medium for the protein sample to be measured. A small volume (50µL) of protein is then injected into the bottom of the cell as a plug of sample. This provides a plug of protein that is far from the electrode surfaces of the zeta potential cell. This method is called a diffusion barrier technique and it protects the protein sample from denaturation by introducing a physical distance between the sample and the electrodes

3. Whether you only have a small volume of sample or a concentrated opaque sample, use the High Concentration-Low Volume cell.

A high concentration zeta potential cell option that uses palladium electrodes and a very small capillary allows for measurement of samples at higher concentrations than previously possible. This sample cell combines two highly desired features in that it is able to make zeta potential measurements on samples up to 40 wt% solids while requiring low sample volumes (as little as 150µL of sample.)

4. The electrophoretic mobility of non-aqueous samples can be measured using the Universal Dip Cell accessory.

The universal dip cell is solvent-resistant and can be used for both aqueous and non-aqueous samples. Highly non-polar media like hexane, heptane and toluene can be used as dispersants with this cell. However, it is multifunctional so it can also be used with aqueous media as well.

5. Zeta potential measurements are carried out using Malvern's patented M3-PALS method.

Zeta potential results using the M3-PALS method provides the highest accuracy and sensitivity available in the market. Malvern's Mixed Mode Measurement was invented and patented for superior accuracy coupled with ease of use. M3-PALS provides high sensitivity zeta potential results utilizing optimized analyses with minimal applied voltage in order to minimize the effects of high electric fields on samples. This Malvern patented procedure uniquely eliminates electro-osmotic effects while preserving the ability to measure zeta potential distributions.

6. Size measurements are carried out by Dynamic Light Scattering (DLS).

The Zetasizer Nano can provide size measurements on samples in the maximum size range from 0.3 nanometers to 10 microns in diameter. It can also make measurements on samples that are extremely dilute, 0.1ppm to highly concentrated in the order of 40 wt% solids, depending on the sample type. Its detection system is self-optimizing and the software adjusts the optics, attenuation and measurement duration in order to produce consistent and reliable data. Expert advice in the software also provides information about how good or poor the data is, as well as possible actions that can be taken to improve the results.

7. Molecular Weight (MW) characterization is available by using static light scattering and the Debye method or additionally with higher resolution by adding the Zetasizer Nano to your Size Exclusion Chromatography (SEC) system.

Static light scattering (SLS) information can be obtained from DLS instrumentation. SLS results provide weight average molecular weight by using the Debye method. The software automates this process by guiding the operator through each step required to complete a MW experiment.

Size Exclusion Chromatography (SEC) can also be used to separate or fractionate the sample into discrete molecular weight components so that highly resolved size and molecular weight results can be determined in a multi-component formulation. The Zetasizer Nano can be added as an additional detector to an SEC system to provide MW information both by estimating MW from absolute size measurements or combined with a concentration signal to give absolute molecular weight.

8. The Non-Invasive Back-Scatter technology allows the use of a broad range of low volume disposable and glass or quartz sample cells.

The broad array of sample cuvettes now on the market for light scattering instruments offers researchers flexibility in their analysis protocols and this flexibility lends itself to improved data quality, faster results and greater assurance of maintaining sample purity.

Low volume cuvettes for size measurements (beginning at 12µL) are available using modern light scattering instruments which help preserve precious samples. There are also a wide variety of disposable and reusable cells available for both size and zeta potential analysis so researchers now have the ability to carry out zeta potential measurements without any concerns of cross contamination between samples.

9. An auto-titrator can be integrated to automate pH and conductivity titrations as well as additive and dilution measurements.

Researchers often need to make comparisons between materials or multiple components that will be mixed into a formulated product. Because of this it is often important to carry out detailed formulation studies rather than single batch size and zeta potential measurements. Measuring size and/or zeta potential as a function of pH, conductivity or concentration of an additive can provide insight into the processes involved in stabilizing or flocculating dispersed systems.

10. Last but not least, the ease of use and software flexibility of the Zetasizer Nano is like no other scientific instrument on the market.

The Zetasizer software is ideally suited for a multi-user environment. A summer student or a visitor to the lab can learn to use this system quickly and easily. Data files can be transferred and the software installed on any computer without purchasing extra software. Further, standard operating procedures and measurement setting automation can be employed to simplify measurements, or the instrument may be operated in either manual or research mode for full user control over every instrument setting and parameter.

Powerful and capable as a true research tool yet easily simplified for operators who might not be considered light scattering experts or power users, the software offers the flexibility to standardize or unlock all functionality as you wish. You can download the latest software from the Malvern website at www.malvern.com .

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