Brookhaven Instruments Corporation

NanoBrook 90Plus PALS

Rapid, Reliable, and Accurate Particle Sizing & Advanced Zeta Potential Analysis

The Brookhaven NanoBrook 90Plus PALS combines the particle sizing capabilities of our 90Plus with the highly sensitive zeta potential measurements of our ZetaPALS instrument into one capable package. It employs Dynamic Light Scattering (DLS) for size determination and Phase Analysis Light Scattering (PALS) for surface charge evaluation of nanoparticles and other nanomaterials.

This instrument allows for rapid measurement of both size and zeta potential, and provides additional information on multimodal distributions in surface charge for polydisperse samples using our standard electrophoretic light scattering (ELS). Unlike ELS, PALS is not limited to low conductivity aqueous solvents and is sensitive enough to provide reliable measurements of zeta potential for very low mobility samples. This includes those dispersed in high conductivity solvents and in many common organic solvents.

Core Functionalities	
Particle Sizing	Yes
Zeta Potential	Yes (PALS)
Scattering Angles	15° & 90°

Key features of Phase Analysis Light Scattering (PALS)

- For proteins, peptides, antibodies, nucleotides, and other biological samples
- For high salt, organic solvents & viscous media
- 1000x more sensitive than other techniques*

* sample dependent

The NanoBrook 90Plus PALS offers results in a variety of useful formats. For routine determinations, an average or effective diameter, and a measure of distribution width or polydispersity, are sufficient for many applications. This same information can be represented as a lognormal distribution, allowing the user to visualize the size distribution and to interpolate both cumulative and differential results. For more complex samples, a multimodal distribution can be produced as well.

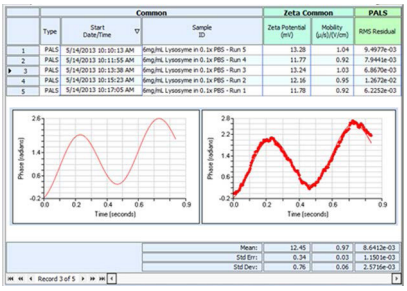
Principles of Operation

The 90Plus PALS can be used to characterize aggregated particles as part of a standard quality control process. This NanoBrook can effectively determine the size of primary particles and agglomerates. Additionally, the aggregation of nanoparticles and other colloidal particles is easily monitored by DLS.

The NanoBrook 90Plus PALS utilizes Phase Analysis Light Scattering (PALS) to determine the electrophoretic mobility of charged, colloidal suspensions. The PALS technique does not require the application of large fields which may result in unwanted sample heating or degradation. During a PALS measurement, the particles only need to move a fraction of their own diameter to yield good results. In salt concentrations up to 3 M and with electric fields as low as 1-2 V/cm, enough movement is induced to get quality results.

Simple, Clear Presentation

The figure to the right shows the results obtained using a NanoBrook 90Plus PALS instrument. The excellent agreement of the five runs in this experiment is obvious as is the match of experimental curve (bold) and it's fitted version (thin). With our Particle Solutions data acquisition and analysis software, users can easily produce a customized report, or select from one of a number of pre-designed templates.



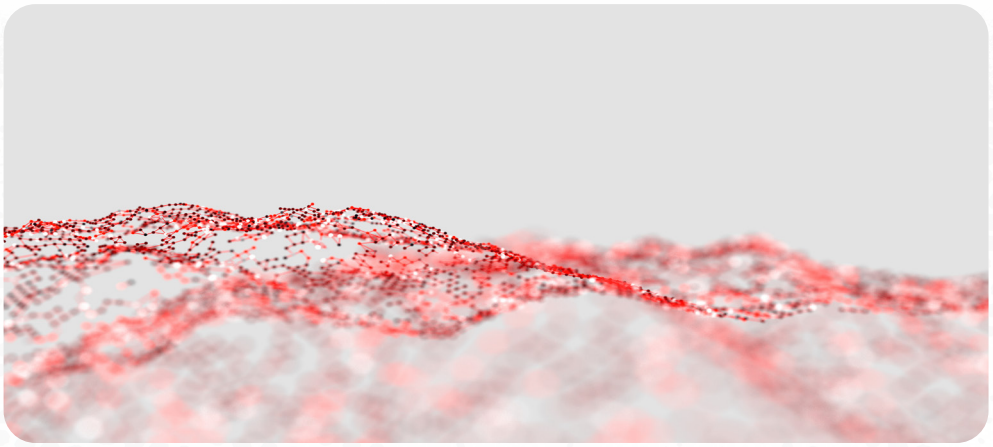
Key Features & Specifications	
Size Range	1 nm to 10 µm diameter*
Mobility Range	10^{-11} to 10^{-7} m^2 /V•s
Zeta Potential Range	-500 mV to 500 mV*
Maximum Sample Conductivity	220 mS/cm*
Concentration Range	2 ppm to 50 mg/mL*
Technique	**Sizing:** Dynamic Light Scattering, DLS **Zeta Potential:** Brookhaven's "True PALS" Phase Analysis Light Scattering, Electrophoretic Light Scattering (ELS)
Algorithms and Models	NNLS, Contin, Cumulants, Lognormal
Correlator	Brookhaven's TurboCorr, multi-τ, research grade with 510 hardware channels, 100% efficiency, real-time operation over the entire delay-time range.
Detection Angles	15° & 90°
Test Standards	Conforms to ISO13321 and ISO22412

* sample dependent

About Brookhaven Instruments

Our talented team of scientists and engineers is dedicated to delivering the most accurate, reliable, and easy-to-use particle characterization instruments on the market. Our modular instrument design allows us to fully customize every aspect of our products, ensuring that our customers receive precisely what they need to meet their research goals. We are continuously improving our products based on feedback from customers, building on our legacy of innovation in particle science.

We strive to act as partners with our customers to ensure they get the most benefit and maximum value from their Brookhaven equipment. We offer extensive post-sale support to educate and empower customers. Whether you have questions about a specific function or are trying to set up a new experiment, our experts will be there to help you every step of the way.



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