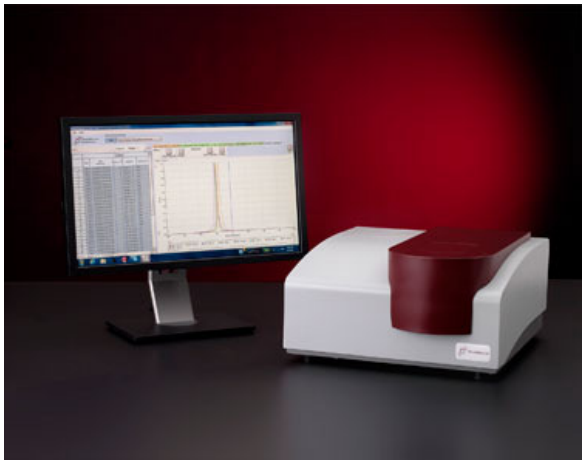
Brookhaven Instruments

ZetaPALS

Zeta Potential & Particle Size Analyzer

For Measurements In:

- Solvents
- High Salt
- Oily or viscous media
- Near the isoelectric point
- 1,000x more sensitive than other techniques



ZetaPALS: A Whole New Concept

For measurements of low mobility, the unique, Brookhaven Instruments ZetaPALS is the answer. There is nothing else like it. With concepts developed at Bristol University and Brookhaven Instruments, the ZetaPALS determines zeta potential using Phase Analysis Light Scattering (PALS): a technique that is up to 1,000 times more sensitive than traditional electrophoretic light scattering.

Electrostatic repulsion of colloidal particles is often the key to understanding the stability of any dispersion. A simple, easy measurement of the electrostatic mobility - even in nonpolar liquids-yields valuable information.

Measurements in water and other polar liquids is easy and fast with the Brookhaven Instruments ZetaPlus. Such measurements cover the range of typically 9 - 100 mV, corresponding to a range of mobilities of 0.5 - 8 x 10^{-8} $m^2/V \cdot s$.

Measurements in low dielectric liquids, or in high viscosity oils, or in high salt concentrations, or even very near the I.E.P. involve mobilities 10, 100, and even 1,000 times smaller. Traditional approaches simply fail under these circumstances or suffer from poor repeatability. With the ZetaPALS such measurements are made in typically 30 - 50 seconds, and the repeatability is typically 1 - 2%.

Carrying On the Tradition, A Unique Cell Design

The same unique cell design that made the Brookhaven Instruments ZetaPlus the standard instrument for use in polar liquids is also used in the ZetaPALS. A design that eliminates electroosmosis, eliminates the need to find stationary planes, allows the user to ignore calibration or alignment: there simply isn't any.

The standard ZetaPALS cell is made of quartz or glass with Kevlar support Au electrodes. When used with water or other simple, nonaggressive liquids, the cell can be switched to the inexpensive, disposable plastic cells with Pd electrodes, the same type used in the ZetaPlus. The precision Peltier temperature control allows measurements from -5 °C to 110 °C.

Particle Sizing Option

An optional feature of the ZetaPALS is the measurement of particle size by dynamic light scattering. Based on the well established technique used in the Brookhaven Instruments 90Plus, particle size and distribution information are obtained in minutes.

Particle size measurements and zeta potential determination are made in the same cell. There is even a choice of two scattering angles, 15° or 90°, for particle sizing.

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Specifications

Zeta Potential	Size Range	1 nm to 100 µm
	Mobility Range	10^{-11} to 10^{-7} $m^2/V \cdot s$
	Zeta Potential Range	-220 mV to 220 mV †
	Maximum Sample Concentration	10% v/v †
	Sample Volume	180 µL, 600 µL, 1,250 µL
	Maximum Sample Conductivity	30 S/m
	Signal Processing	Phase Analysis Light Scattering, PALS
Particle Size	Size Range	< 0.3 nm to > 3 microns
	Sample Volume	10 µL, 40 µL, 1 - 3 mL
	Concentration Range	0.1 mg/mL to 10% v/v †
Molecular Weight	Molecular Weight Range (estimated from hydrodynamic diameter)	1 kDa to 25 MDa
	Molecular Weight Range (calculated using Debye plot) requires BI-APD	1 kDa to 25 MDa
	Minimum Sample Volume	10 µL
General	Temperature Control Range	-5 ℃ to 110 ℃ ± 0.2 ℃
	Measurement Angles	Three angles, two for particle sizing, one for zeta potential
	Condensation control	Purge facility using dry air, nitrogen preferred
	Standard Laser	35 mW red diode laser, nom 660 nm
	Correlator	TurboCorr
Accessories	BI-ZTU	Autotitrator
	BI-870	Dielectric constant meter
	Uzgiris Cell	Standard, eliminates electro-osmosis completely
Options	Laser	HeNe 632.8 nm, frequency doubled 532 nm
	BI-MAS	Required for particle size measurements
	BI-APD	Required detector for molecular weight measurements
	90PDP	Required for Debye plot measurements
	Narrow Band Filters	632.8 nm, 532 nm to block fluorescence
	Flow Mode Option	90PFC flow cell allows DLS size for GPC/SEC
	21 CFR Part 11 Software Option	Software assists ERES compliance

Note: † sample dependent

A policy of continual improvement may lead to specification changes

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