PARTICLE SIZE

ZETA POTENTIAL

MOLECULAR WEIGHT

RHEOLOGICAL PROPERTIES

BeNano Series

Be the Nanoparticle Expert You Need

Bettersize

BETTER PARTICLE SIZE SOLUTIONS

Be the Nanoparticle Expert You Need

The BeNano Series is the latest generation of nanoparticle size and zeta potential analyzer developed by Bettersize Instruments Ltd. Dynamic light scattering (DLS), electrophoretic light scattering (ELS) and static light scattering (SLS) are integrated into the system to provide accurate measurements of particle size, zeta potential, molecular weight and rheological properties.

APPLICATIONS

The BeNano Series is widely applied in academic research and manufacturing processes across various fields, including but not limited to pharmaceuticals, nanomaterials, household chemicals, foods and beverages, and academia.

Pharmaceuticals

Sample: Fat emulsions, liposomes, vaccines, hydrogels, etc.

In the field of pharmaceuticals, the BeNano can evaluate systematic stability and alleviate risks in formulations by characterizing size and zeta potential, accelerating the R&D process. The size and size distribution of drugs and drug delivery systems are closely related to the manufacturing process and significantly impact bioavailability, efficacy, and immune response produced by the final product.

Proteins & Polypeptides

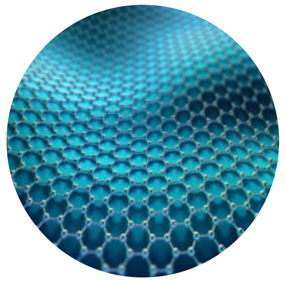
Sample: Lysozyme, Human serum albumin, Immunoglobulin G (IgG), etc.

For a protein formulation, it's important to detect subtle changes in size and stability to ensure efficacy and safety. Proteins in poor formulations are likely to form aggregates, which will reduce the efficacy of protein drugs and, even worse, cause immunological reactions and toxicity. To prevent these issues, the BeNano provides rapid access to the characterization of proteins in terms of size and stability information.

Paints, Inks & Coatings

Sample: Oil-based and water-based paints, organic pigments, ceramic inks, etc.

The size and size distribution of paints, inks, and coatings are crucial indicators for ensuring a long shelf life and optimal performance. Poor product quality may lead to aggregation, color inconsistencies, and blockages in channels or nozzles. By using the BeNano to measure these properties, manufacturers can improve formulation development and enhance product performance.



Nanomaterials

Sample: Silver nanoparticles (AgNPs), quantum dots, titanium dioxide, zinc oxide, synthetic silica, etc.

Nanomaterials have wide applications in emerging technologies such as nanoelectronics, nanophotonics, energy conversion, etc. Many of the physicochemical properties associated to nanomaterials are strongly dependent upon the size and particle-particle interaction. With the BeNano, researchers could easily carry out the measurements of size and zeta potential.

Household Chemicals

Sample: Cosmetics, shampoos, detergents, etc.

Nanomaterials dispersed in sun creams block ultraviolet radiation from the sun. The smaller the particle size, the larger the surface area and the smoother the cream feels. Surfactants in the detergents may remove oil contamination by forming microemulsions. The decontamination effect depends on the type of surfactants used and the size of emulsion droplets. The characterization of nanomaterials is related to all aspects of life.

Foods and Beverages

Sample: Soft drinks, dairy products, confectioneries, plant-based products, etc.

Studies on food and beverages can be performed using the BeNano for characterizing size and zeta potential, in order to optimize the stability of dispersions and emulsifications, which improves the appearance, taste and mouthfeel, and also prolongs the shelf life of products.

Abrasives

Sample: Nano alumina, nano silicon carbide, nano diamond, cubic boron nitride (CBN), etc.

Nano abrasives are extensively used for high-precision polishing and surface finishing of materials such as optical lenses, crystals, gemstones, semiconductors, etc. The stability of polishing slurry is significant for preventing the formation of aggregates that may lead to scratches on workpieces. The BeNano is capable of characterizing the size and zeta potential of slurries, even those with high concentrations.

Academia

Sample: Fundamental and frontier researches related to size, zeta potential, molecular weight, etc.

Measurements of size, zeta potential and molecular weight derived from the BeNano provide a powerful tool for academic research, ranging from verifying theory extrapolations to exploring novel synthetic substances. The accurate and highly reproducible data generated by the BeNano ensure the authenticity and reliability of the research results.

Unlock Greater Research Potential With BeNano

- **Advanced ELS Technology: PALS**

  PALS technology can effectively distinguish and extract the electrophoretic behavior even for sample with weak eletrophoretic mobilities, either close to isoelectrical point or with high salinity environment.

- **Temperature Trend Measurement**

  For thermal sensitive samples, a temperature trend can be performed easily with a programmed SOP. The BeNano can detect the temperature transition point of the size results, which is the aggregation temperature for protein samples.

- **Trace Sample Volume**

  Measuring trace amount of sample is required for early-stage R&D in pharmaceutical industry and academia. With the capillary sizing cell, only 3 to 5 μL of sample is needed for precise size measurement.

- **Advanced DLS Technology: Backscattering Detection**

  Backscattering DLS optics can detect much larger scattering volume compared to 90-degree optics. Combined with movable measurement position, backscattering DLS offers much higher sensitivity and high turbidity sample measurement capacity.

- **Research Level Software**

  The BeNano software can evaluate and process scattered light signals intelligently to improve the signal quality and result stability. Various built-in calculation modes can cover multiple scientific research and application fields.

- **Stable and Durable Optical Bench**

  The BeNano adopts a 50mW solid-state laser, a single-mode fiber system and a high-performance APD detector, providing stable, wide-ranging, and highly redundant detection capabilities.

Measurable Parameters

Hydrodynamic diameter **D_H**

Polydispersity index **PDI**

Intensity, volume, area and number distributions

Diffusion coefficient **D**

Interaction parameter **k_D**

Zeta potential and its distribution

Isoelectric point **IEP**

Molecular weight **Mw**

Viscoelastic modulus **G', G"**

Model	Technology			Key Function			
	90° DLS & SLS	173° DLS & SLS	12° ELS & PALS	Particle size	Zeta potential	Molecular weight	Microrheology
BeNano 180 Zeta Pro	√	√	√	√	√	√	√
BeNano 180 Zeta		√	√	√	√	√	√
BeNano 90 Zeta	√		√	√	√	√	√
BeNano Zeta			√		√		
BeNano 180 Pro	√	√		√		√	√
BeNano 180		√		√		√	√
BeNano 90	√			√		√	√

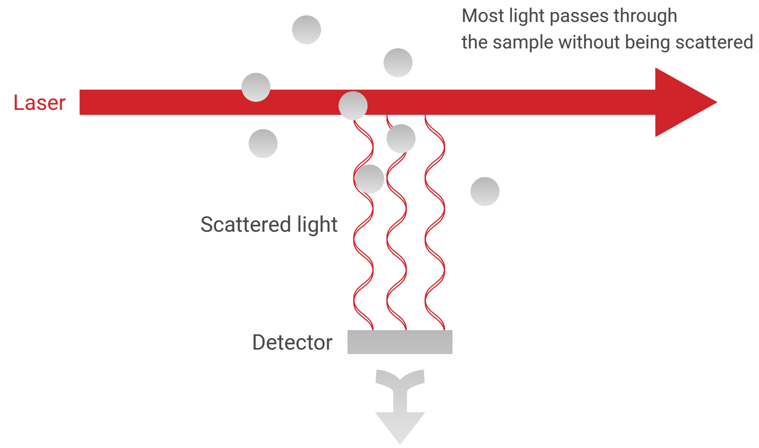
Particle Size Measured by DLS

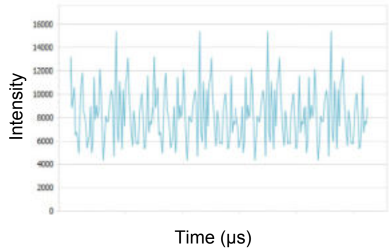
Dynamic light scattering (DLS), also referred to as photon correlation spectroscopy (PCS) or quasi-elastic light scattering (QELS), is a technique used to measure Brownian motion in a dispersant. It is based on the principle that smaller particles move faster while larger particles move slower. The scattering intensities of the particles are detected by an avalanche photodiode (APD) and then converted into a correlation function using a correlator. From this correlation function, a mathematic algorithm can be applied to obtain the diffusion coefficient (D). The hydrodynamic diameter (D_H) and its distribution can be calculated using the Stokes-Einstein equation, which relates the diffusion coefficient to the particle size.

$$D = \frac{K_B T}{3\pi\eta D_H}$$

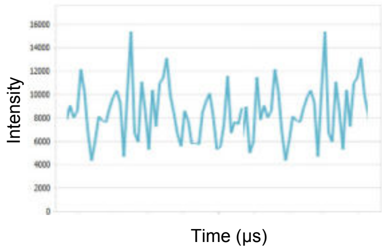
Applications

1. Particle size and distribution of polymers, colloids, biomacromolecules, etc.
2. Research on thermal-sensitive systems, such as PNIPAm polymer.
3. Studies on the polymerization process and reaction mechanisms.
4. Kinetics analysis of self-assembly, polymerization, and depolymerization, etc.

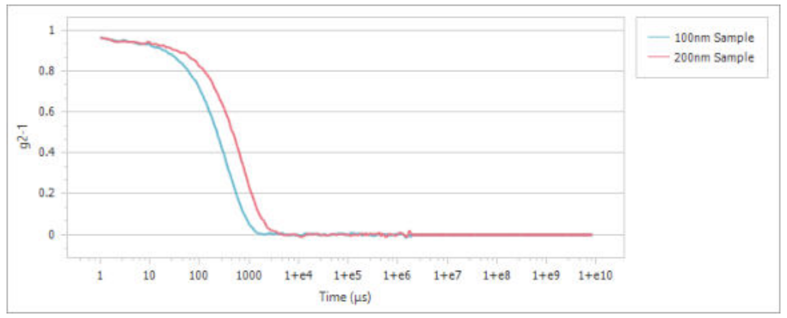




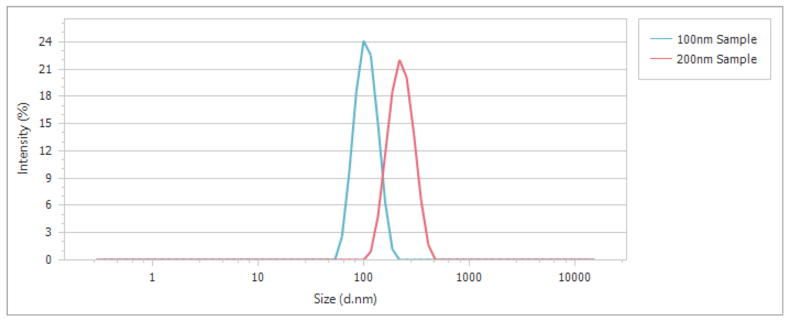
Intensity Fluctuations of Small Particles



Intensity Fluctuations of Large Particles



In correlation functions, a 200nm sample decays slower than a 100nm sample due to slower intensity fluctuation.



From the above correlation functions, the size and size distribution can be determined using the Stokes-Einstein equation.

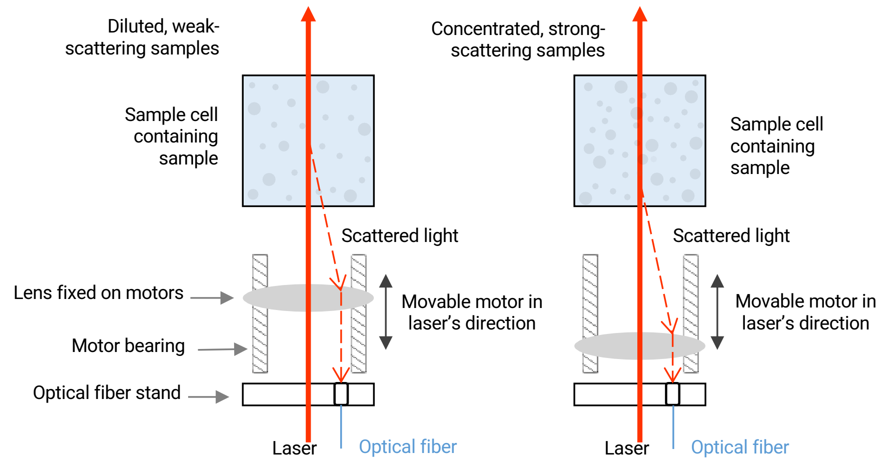
Backscattering Detection Technology

Features

- **Wider Concentration Range**
  By optimizing the detection position, the highly concentrated samples can be detected near the edge of the sample cell, effectively minimizing the multiple light scattering effect.
- **Higher Sensitivity**
  8 - 10 times scattering volume and around 10 times sensitivity as compared to the traditional 90° optical design.
- **Higher Size Upper Limit**
  It mitigates multiple light scattering from large particles and, to some extent, reduces the number fluctuation of large particles due to the much larger scattering volume.
- **Better Reproducibility**
  The DLS backscattering technology is less influenced by dust contaminants and unevenly distributed agglomerates and provides better reproducibility.

Intelligent Search for the Optimal Detection Position

The software automatically determines the optimal detection position based on the size, concentration, and scattering ability of the sample to achieve the highest measurement accuracy and offer flexibility in detecting different types and concentrations of samples. This feature is particularly useful when dealing with a variety of samples, each with its unique scattering properties and concentrations.

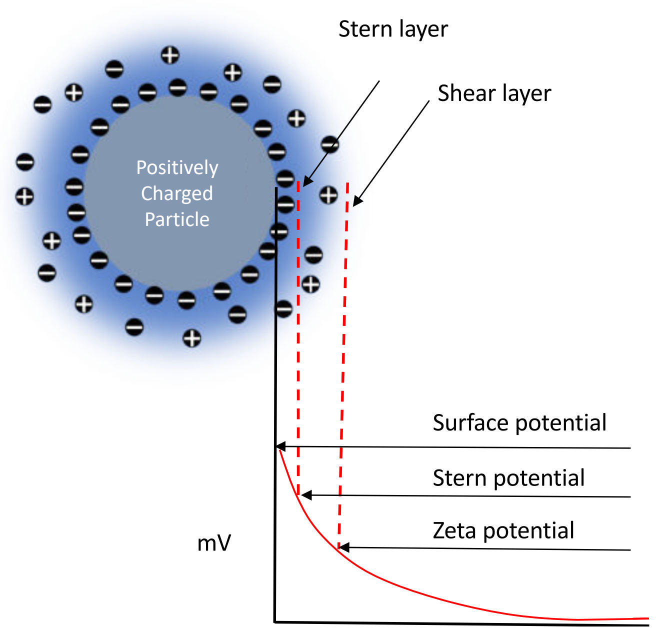


1. **The detection point in the middle of the sample cell**
   This leads to a large scattering volume that increases instrument sensitivity and is suitable for detecting dilute samples with weaker scattering effects.
2. **The detection point at the edge of the sample cell**
   This avoids the multiple scattering effect of high concentration samples, ensuring accurate and repeatable particle size results.

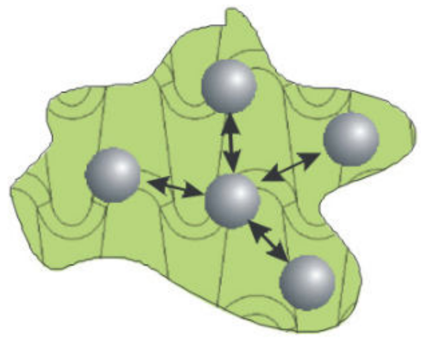
Zeta Potential Measured by ELS

In aqueous systems, charged particles are surrounded by counter-ions that form an inner Stern layer and an outer shear layer. Zeta potential is the electrical potential at the interface of the shear layer. A higher zeta potential indicates greater stability and less aggregation of the suspension system. Electrophoretic light scattering (ELS) measures electrophoretic mobility via Doppler shifts of scattered light, which can be used to determine the zeta potential of a sample by Henry's equation.

$$\mu = \frac{2\varepsilon_r\varepsilon_0\zeta}{3\eta} f(\kappa a)$$



Potential Distribution at Particle Surface

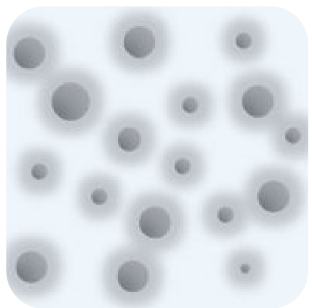


Electrostatic Forces Between Particles

Applications

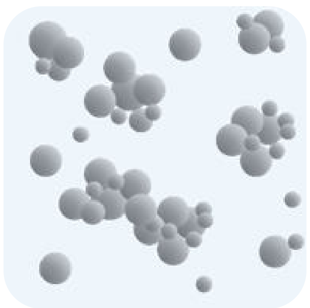
1. Particle suspensions, including colloids, proteins, nanometals, etc
2. Industries such as chemicals, biology, water treatment, paints, etc
3. Product stability control and monitoring
4. Stability research and control of suspension system
5. Surface property and modification study

Colloidal Stability



Stable particle system

- High repulsion force of particles
- High zeta potential

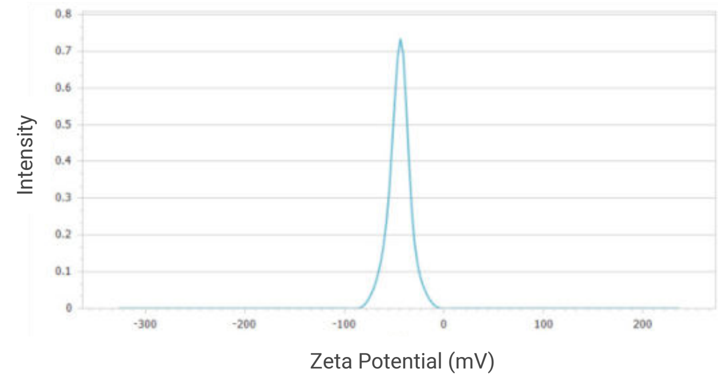


Unstable particle system

- Flocculation, aggregation, sedimentation
- Low or zero zeta potential

PALS:
Phase Analysis Light Scattering

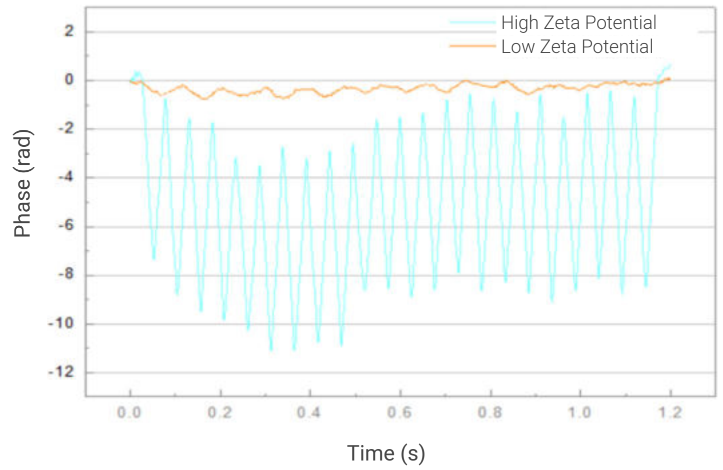
Phase analysis light scattering (PALS) is an advanced technology based on the traditional ELS technology, which has been further developed by Bettersize to measure the zeta potential and its distribution of a sample.



Zeta Potential Distribution

Features & Benefits

- Accurate measurement of samples with low electrophoretic mobility
- Effective for samples in organic solvents with low dielectric constant
- More accurate results for samples with high conductivity
- Effectively measures the zeta potential of particles whose charge approaches the isoelectric point



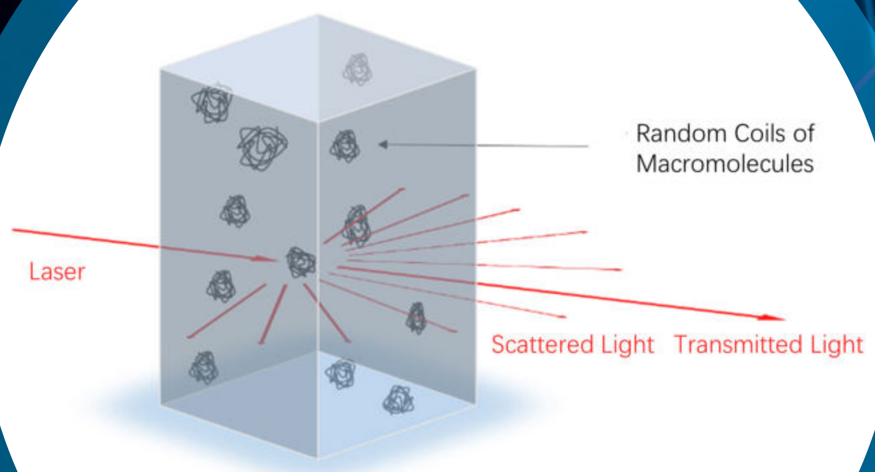
Phase Plot of PALS

Static Light Scattering (SLS)

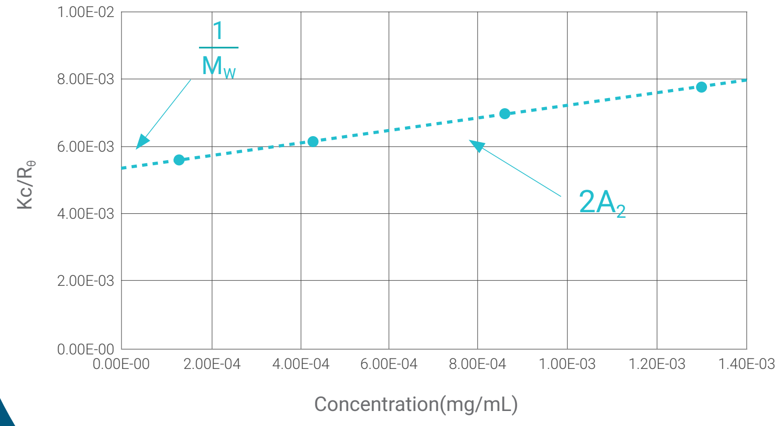
Static light scattering (SLS) is a technology that measures the scattering intensities, weight-average molecular weight (M_w) and second virial coefficient (A_2) of the sample through Rayleigh equation:

$$\frac{Kc}{R_\theta} = \frac{1}{M_W} + 2A_2c$$

where c is the sample concentration, θ is the detection angle, R_θ is the Rayleigh ratio used to characterize the intensity ratio between the scattered light and the incident light at the angle of θ, M_w is the sample's weight-average molecular weight, A_2 is the second virial coefficient, and K is a constant related to $(dn/dc)^2$.



Scattered Light of Macromolecules



Debye Plot

Applications

1. **Chemical engineering:** characterization of polymers, micelles and macromolecules
2. **Life science:** characterization of proteins, polypeptides, and polysaccharides
3. **Pharmaceuticals:** research on aggregation and stability of drugs and biomacromolecules

Microrheology Measured by DLS

Dynamic Light Scattering Microrheology (DLS Microrheology) is an economical and efficient technique that utilizes dynamic light scattering to determine rheological properties. By analyzing the Brownian motion of colloidal tracer particles, information about the viscoelastic properties of the system, such as viscoelastic modulus, complex viscosity and creep compliance, can be obtained with the generalized Stokes-Einstein equation.

Stokes-Einstein equation

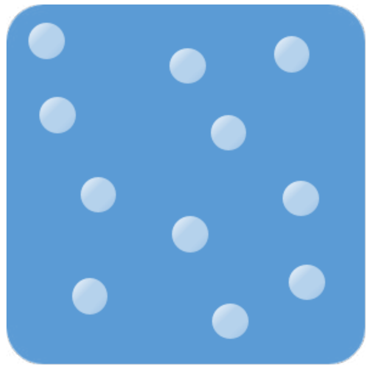
$$G^*(\omega) = \frac{k_BT}{\pi Ri\langle \Delta r^2(i\omega)\rangle} = G'(\omega)+iG''(\omega)$$

Microrheology Information

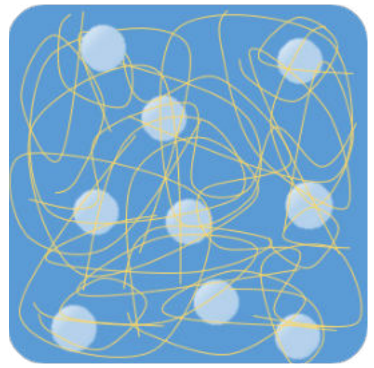
Elastic (storage) modulus	G'	Complex viscosity	η*
Viscous (loss) modulus	G''	Creep compliance	J

Features & Benefits

- Investigates rheological behaviors by measuring the thermally-driven motion of tracer particles within a material being studied
- Facilitates the measurement across a wide range of frequencies
- Applies low stress to tracer particles
- Requires only a microliter-scale sample volume
- Complements mechanical rheology results
- Suitable for weakly-structured samples



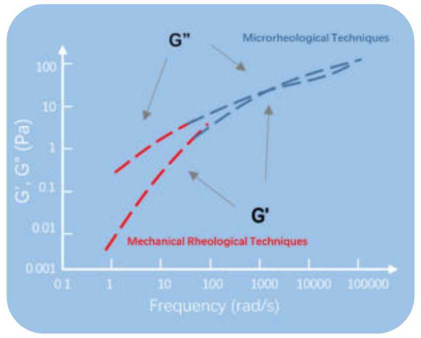
Particles in pure viscous fluids



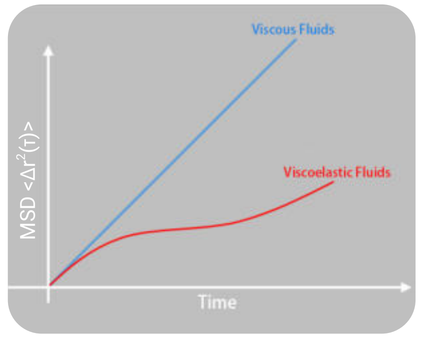
Particles in complex viscoelastic fluids

Applications

1. Polymer solution
2. Protein solution
3. Gel system



G' and G'' curves of complex fluids



MSD curves of particles in pure viscous fluids and complex viscoelastic fluids

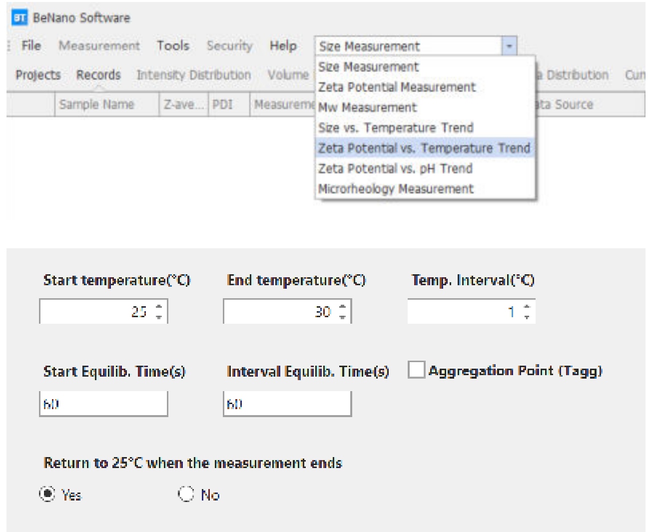
Temperature Trend Measurement

Measurement Parameters

- Size vs. Temperature
- Zeta Potential vs. Temperature

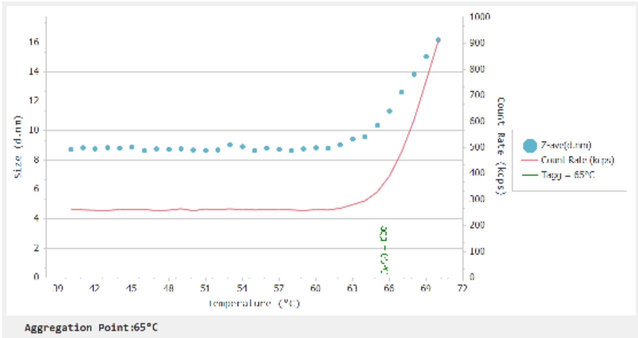
Features

- Temperature trend measurement function (-15°C to 110°C)
- Significant for investigating particle size and zeta potential under different temperatures



Benefits

- Benefit protein formulation stability study
- Accelerates real-time aging through elevated temperature simulation



Size vs. Temperature trend measurement of the BSA protein

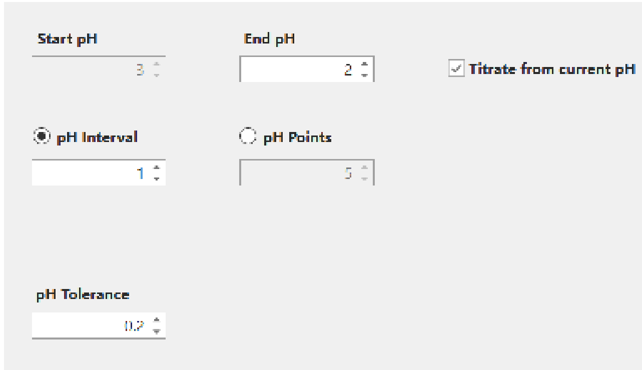
pH Trend Measurement

Measurement Parameters

- Zeta potential vs. pH
- Isoelectric point
- Conductivity vs. pH

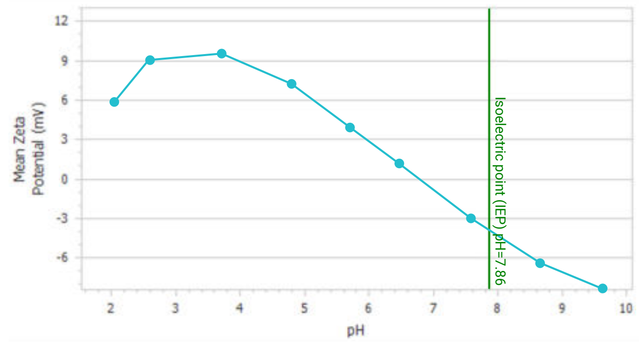
Features

- High-precision ternary titration pumps
- Controllable peristaltic pump with high flow capacity and high flow rate
- General-purpose electrode
- Automated titrant selection based on initial and target pH using intelligent software



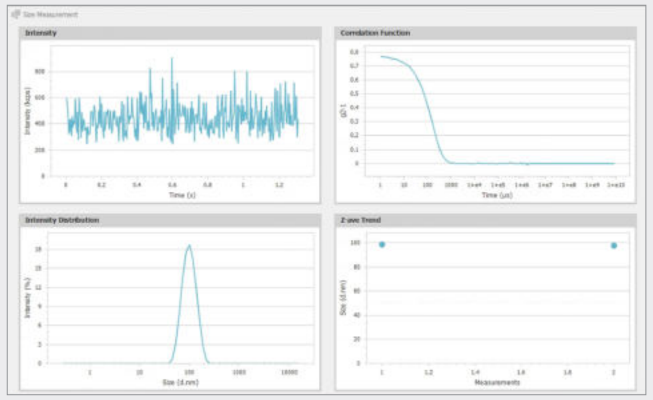
Benefits

- Completes measurements within a shorter time
- Improves consistency and repeatability of results
- Reduces the workload of researchers
- Simplifies qualifications needed for operators
- Reduces exposure to corrosive liquids



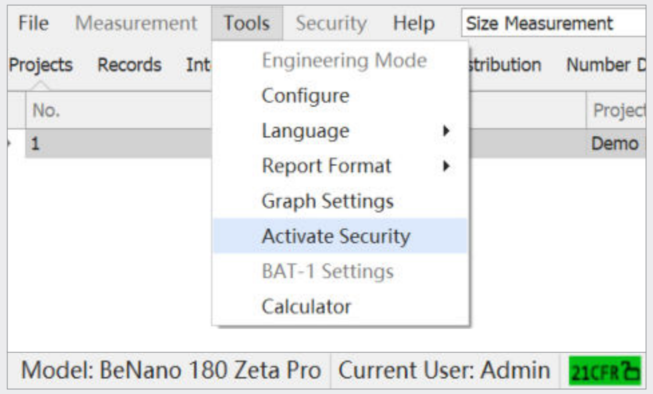
A Research Level Software

- SOP guarantees measurement accuracy and completeness
- Automatic calculation of mean and standard deviation for results and statistics
- Comparison of results from multiple runs through statistics and overlay functions
- Real-time display of information and results
- Over 100 available parameters that meet research, QA, QC, and production needs
- Free lifelong upgrades provided



Compliance With **FDA 21 CFR Part 11**

The BeNano software system is compliant with 21 CFR Part 11 regulations, which restricts access to authorized individuals through a username and password system for electronic record signing, access logs, change logs, or operation execution. An activation code can be used to upgrade security settings and ensure compliance, and an "audit trail" can be viewed to ensure proper management and maintenance of system security and data integrity.



CUVETTES

Folded Capillary Cell BT-C1

For aqueous samples in zeta potential measurement

Material: PC, Gold-plated Phosphor Bronze

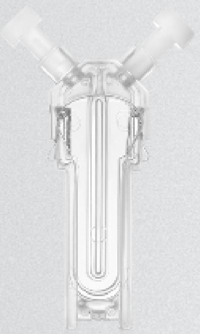
Sample Volume: 0.75 mL

Temperature Range: -15 - 70 °C

Details:

• Optical path of 4 mm, capable of measuring samples with a maximum concentration of 40% w/v

• High-tech but disposable item with a low usage cost



Folded Capillary Cell BT-C1-Pt

For aqueous samples in zeta potential measurement

Material: PC, Platinum

Sample Volume: 0.75 mL

Temperature Range: -15 - 70 °C

Details:

• Optical path of 4 mm, capable of measuring samples with a maximum concentration of 40% w/v

• High salinity tolerance

Dip Cell

For aqueous and organic samples in zeta potential measurement

Material: PEEK, Platinum

Sample Volume: 1 - 1.5 mL

Temperature Range: -15 - 70 °C

Capillary Sizing Cell

For aqueous and organic samples with ultra-micro volume required in size measurement

Material: Glass

Sample Volume: 3 - 5 μL

Temperature Range: -15 - 70 °C

Details:

• Extremely low sample volume required (3 - 5 μL)

• Avoid large particle sedimentation and allow for larger particle measurement up to 15 μm

PS Cuvette

For aqueous samples in size measurement

Material: PS

Sample Volume: 1 - 1.5 mL

Temperature Range: -15 - 70 °C

Micro-volume PS Cuvette

For aqueous samples with micro volume required in size measurement

Material: PMMA

Sample Volume: 40 - 50 μL

Temperature Range: -15 - 70 °C

Glass Cuvette (square lid)

For aqueous and organic samples in size measurement

Material: Glass

Sample Volume: 1 - 1.5 mL

Temperature Range: -15 - 110 °C

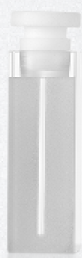
Glass Cuvette (round lid)

For aqueous and organic samples with better sealing performance in size measurement

Material: Glass

Sample Volume: 1-1.5 mL

Temperature Range: -15 - 110 °C



Micro-volume Glass Cuvette

For aqueous samples with micro volume required in size measurement

Material: Glass

Sample Volume: 25 μL

Temperature Range: -15 - 110 °C

BAT-1 AUTOTITRATOR

The BAT-1 autotitrator, a highly recommended accessory for the BeNano series, is an ideal option for analyzing the zeta potential as a function of pH and determining the isoelectric point (IEP) of a colloidal system. It is equipped with three high-precision titration pumps (with a precision of 0.28 μL), and the system can select the optimal titrant and adjust the addition volume intelligently to optimize titration efficiency and accuracy.

Making pH titration more efficient, more accurate and safer

Prepare the titrants

↓

Calibrate the pH probe

↓

Create an SOP

↓

Start the test and wait

↓

Check the results

Function	Parameter	BeNano 180 Zeta Pro	BeNano 180 Zeta	BeNano 90 Zeta	BeNano Zeta	BeNano 180 Pro	BeNano 180	BeNano 90
Size measurement	Size measurement range	0.3 nm - 15 μm*	0.3 nm - 10 μm*	0.3 nm - 15 μm*	N/A	0.3 nm - 15 μm*	0.3 nm - 10 μm*	0.3 nm - 15 μm*
	Sample volume	3 μL - 1 mL*	40 μL - 1 mL*	3 μL - 1 mL*	N/A	3 μL - 1 mL*	40 μL - 1 mL*	3 μL - 1 mL*
	Detection angle	90° & 173° & 12°	173° & 12°	90° & 12°	N/A	90° & 173°	173°	90°
	Analysis algorithm	Cumulants, General Mode, CONTIN	Cumulants, General Mode, CONTIN	Cumulants, General Mode, CONTIN	N/A	Cumulants, General Mode, CONTIN	Cumulants, General Mode, CONTIN	Cumulants, General Mode, CONTIN
	Upper limit of concentration range	40% w/v*	40% w/v*	Optically clear†	N/A	40% w/v*	40% w/v*	Optically clear†
	Detection position	Movable position 0.4 - 5 mm	Movable position 0.4 - 5 mm	Fixed position 5 mm	N/A	Movable position 0.4 - 5 mm	Movable position 0.4 - 5 mm	Fixed position 5 mm
Zeta potential measurement	Detection angle	12°	12°	12°	12°	N/A	N/A	N/A
	Zeta potential measurement range	No actual limitation	No actual limitation	No actual limitation	No actual limitation	N/A	N/A	N/A
	Electrophoretic mobility	> ± 20 μm·cm/V·s	> ± 20 μm·cm/V·s	> ± 20 μm·cm/V·s	> ± 20 μm·cm/V·s	N/A	N/A	N/A
	Conductivity	0 - 260 mS/cm	0 - 260 mS/cm	0 - 260 mS/cm	0 - 260 mS/cm	N/A	N/A	N/A
	Sample volume	0.75 - 1 mL	0.75 - 1 mL	0.75 - 1 mL	0.75 - 1 mL	N/A	N/A	N/A
	Sample size	2 nm - 110 μm*	2 nm - 110 μm*	2 nm - 110 μm*	2 nm - 110 μm*	N/A	N/A	N/A
Other measurement	Molecular weight (Mw)	342 Da - 2 x 10^7 Da*	342 Da - 2 x 10^7 Da*	342 Da - 2 x 10^7 Da*	N/A	342 Da - 2 x 10^7 Da*	342 Da - 2 x 10^7 Da*	342 Da - 2 x 10^7 Da*
	Microrheology frequency range	0.2 rad/s - 1.3 x 10^7 rad/s*	0.2 rad/s - 1.3 x 10^7 rad/s*	0.2 rad/s - 1.3 x 10^7 rad/s*	N/A	0.2 rad/s - 1.3 x 10^7 rad/s*	0.2 rad/s - 1.3 x 10^7 rad/s*	0.2 rad/s - 1.3 x 10^7 rad/s*
	Viscosity	0.01 cp - 100 cp*	0.01 cp - 100 cp*	0.01 cp - 100 cp*	N/A	0.01 cp - 100 cp*	0.01 cp - 100 cp*	0.01 cp - 100 cp*
	Interaction parameter K_D	No actual limitation	No actual limitation	No actual limitation	N/A	No actual limitation	No actual limitation	No actual limitation
	Trend measurement	Time, temperature and pH	Time, temperature and pH	Time, temperature and pH	Time, temperature and pH	Time, temperature and pH	Time, temperature and pH	Time, temperature and pH
System parameter	Temperature control range	-15℃ - 110℃ , ± 0.1℃	-15℃ - 110℃ , ± 0.1℃	-15℃ - 110℃ , ± 0.1℃	-15℃ - 110℃ , ± 0.1℃	-15℃ - 110℃ , ± 0.1℃	-15℃ - 110℃ , ± 0.1℃	-15℃ - 110℃ , ± 0.1℃
	Condensation control	Dry air or nitrogen	Dry air or nitrogen	Dry air or nitrogen	Dry air or nitrogen	Dry air or nitrogen	Dry air or nitrogen	Dry air or nitrogen
	Laser source	50 mW Solid-state laser, 633 nm✳, Class 1	50 mW Solid-state laser, 671 nm✳, Class 1	50 mW Solid-state laser, 671 nm✳, Class 1	50 mW Solid-state laser, 671 nm✳, Class 1	50 mW Solid-state laser, 671 nm✳, Class 1	50 mW Solid-state laser, 671 nm✳, Class 1	50 mW Solid-state laser, 671nm✳, Class 1
	Correlator	Up to 4000 channels, 10^{11} linear dynamic	Up to 4000 channels, 10^{11} linear dynamic range	Up to 4000 channels, 10^{11} linear dynamic range	Up to 4000 channels, 10^{11} linear dynamic range	Up to 4000 channels, 10^{11} linear dynamic range	Up to 4000 channels, 10^{11} linear dynamic range	Up to 4000 channels, 10^{11} linear dynamic range
	Detector	Avalanche photodiode (APD)	Avalanche photodiode (APD)	Avalanche photodiode (APD)	Avalanche photodiode (APD)	Avalanche photodiode (APD)	Avalanche photodiode (APD)	Avalanche photodiode (APD)
	Intensity control	0.0001% - 100%, manual or automatic	0.0001% - 100%, manual or automatic	0.0001% - 100%, manual or automatic	0.0001% - 100%, manual or automatic	0.0001% - 100%, manual or automatic	0.0001% - 100%, manual or automatic	0.0001% - 100%, manual or automatic
	Dimensions (L x W x H)	62.5 x 40 x 24.5 cm (22 kg)	62.5 x 40 x 24.5 cm (22 kg)	62.5 x 40 x 24.5 cm (22 kg)	62.5 x 40 x 24.5 cm (22 kg)	62.5 x 40 x 24.5 cm (22 kg)	62.5 x 40 x 24.5 cm (22 kg)	62.5 x 40 x 24.5 cm (22 kg)
	Power supply	AC 100 - 240 V, 50 - 60 Hz, 4A	AC 100 - 240 V, 50 - 60 Hz, 4A	AC 100 - 240 V, 50 - 60 Hz, 4A	AC 100 - 240 V, 50 - 60 Hz, 4A	AC 100 - 240 V, 50 - 60 Hz, 4A	AC 100 - 240 V, 50 - 60 Hz, 4A	AC 100 - 240 V, 50 - 60 Hz, 4A
	Compliance	21 CFR Part 11, ISO 13321, ISO 22412, ISO 13099	21 CFR Part 11, ISO 13321, ISO 22412, ISO 13099	21 CFR Part 11, ISO 13321, ISO 22412, ISO 13099	21 CFR Part 11, ISO 13321, ISO 22412, ISO 13099	21 CFR Part 11, ISO 13321, ISO 22412, ISO 13099	21 CFR Part 11, ISO 13321, ISO 22412, ISO 13099	21 CFR Part 11, ISO 13321, ISO 22412, ISO 13099
Optional Accessory	Micro-volume PS cuvette	40 - 50 μL	40 - 50 μL	40 - 50 μL	N/A	40 - 50 μL	40 - 50 μL	40 - 50 μL
	Micro-volume glass cuvette	25 - 50 μL	N/A	25 - 50 μL	N/A	25 - 50 μL	N/A	25 - 50 μL
	Glass cuvette (round lid)	1 - 1.5 mL	1 - 1.5 mL	1 - 1.5 mL	N/A	1 - 1.5 mL	1 - 1.5 mL	1 - 1.5 mL
	Capillary sizing cell	3 - 5 μL	N/A	3 - 5 μL	N/A	3 - 5 μL	N/A	3 - 5 μL
	Dip cell	1 - 1.5 mL, zeta potential measurement for organic-based samples	1 - 1.5 mL, zeta potential measurement for organic-based samples	1 - 1.5 mL, zeta potential measurement for organic-based samples	1 - 1.5 mL, zeta potential measurement for organic-based samples	N/A	N/A	N/A

*** Dependent on samples and accessories** **† Up to 40% w/v using capillary sizing cell** **✳ 10mW 633 nm HeNe laser available on request**

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