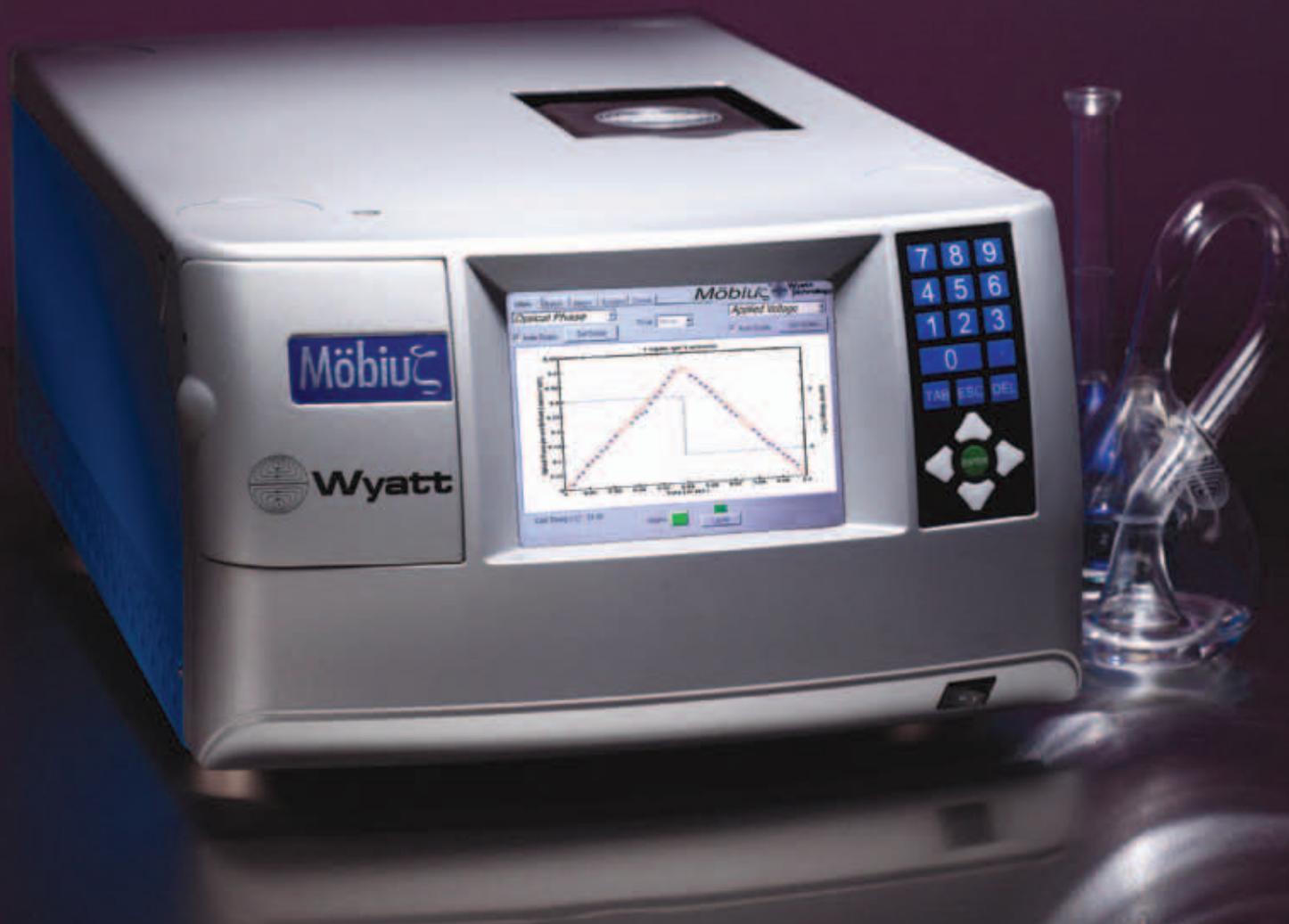




# Möbiuζ™

The finest, most versatile light scattering instrument  
for reliable electrophoretic mobility measurements  
of proteins, particles, and macromolecules.



# The Möbiuζ™

The finest, most versatile light scattering instrument for reliable electrophoretic mobility measurements of proteins, particles, and macromolecules.

Wyatt Technology's Möbiuζ is the *first* and only light scattering instrument that makes reliable, reproducible, and non-destructive electrophoretic mobility measurements of macromolecules as small as 1 nm, under dilute solution conditions.

The Möbiuζ was designed with the goal of measuring the mobility and the hydrodynamic radius of precious protein samples, without perturbing these fragile species. By overcoming the challenges presented by these delicate nanoparticles, the technological advancements embodied in the Möbiuζ offer unique capabilities for traditional applications.

Electrical charge is a fundamental property of all macromolecules. In colloidal suspensions, the formulation stability depends critically on the amount of charge developed at the interfaces between particles and their solvent. For most biomolecules—like proteins—electrostatic interactions exercise a profound influence on their conformation, function, and efficacy. Practically speaking, electrophoretic mobility has been the most popular and widely accepted proxy for the molecular charge and interfacial potential, also known as the zeta potential.

## The Novelty of the Möbiuζ...

The simultaneous measurement of the hydrodynamic radius is available with the embedded WyattQELS option.

When measuring colloids, liposomes, and virus-like particles, the Möbiuζ quickly determines these mobilities by collecting *thirty times* as much data as conventional zeta potential technologies. More data—in less time—means more precise results and greater reproducibility.

Existing instruments have severe limitations. Due to their low detection sensitivity, high concentrations of protein samples are required. Furthermore, in their attempts to measure protein mobilities, high voltages are applied to the samples, and this causes a host of problems, such as electrolysis, irreversible sample degradation, and burning of samples onto electrodes. Even under the best conditions, these instruments' results are non-reproducible and often erroneous.

Because of its multi-detector array and other state-of-the-art technological advances, the Möbiuζ transcends the limitations of these old-fashioned technologies.

The Möbiuζ successfully captures fundamental data under solution conditions *never before achieved* by conventional technologies. Given its manifold technological advancements, the Möbiuζ is up to *ten times* more sensitive than the other instruments on the market.

Whether you need to determine the charges carried by your antibody formulations or the stability of a solution of quantum dots, the Möbiuζ can produce the results in as few as 30 seconds. With the Möbiuζ, there is no more protein cooking, no more fidgeting with voltage and current conditions, and no more neutral markers.

## The More of the Möbiuζ...

The Möbiuζ means *more* detectors at *more* angles, for *more* data, yielding higher sensitivity and the most reproducible results zeta potential users have ever seen. The Möbiuζ also means *more* information, *more* convenience, and the highest productivity zeta potential users have ever had. To make *more* out of your Möbiuζ, the simultaneous measurement of the hydrodynamic radius is available with the embedded WyattQELS™

option. Integrated within the Möbiuζ, the WyattQELS utilizes proprietary optics, high quantum efficiency detection, and novel data processing to analyze backscattered light. The WyattQELS also provides an estimate of the molar mass from the measured hydrodynamic radius utilizing any one of several molecular models.

More importantly, the pairing of the WyattQELS and the Möbiuζ provides you

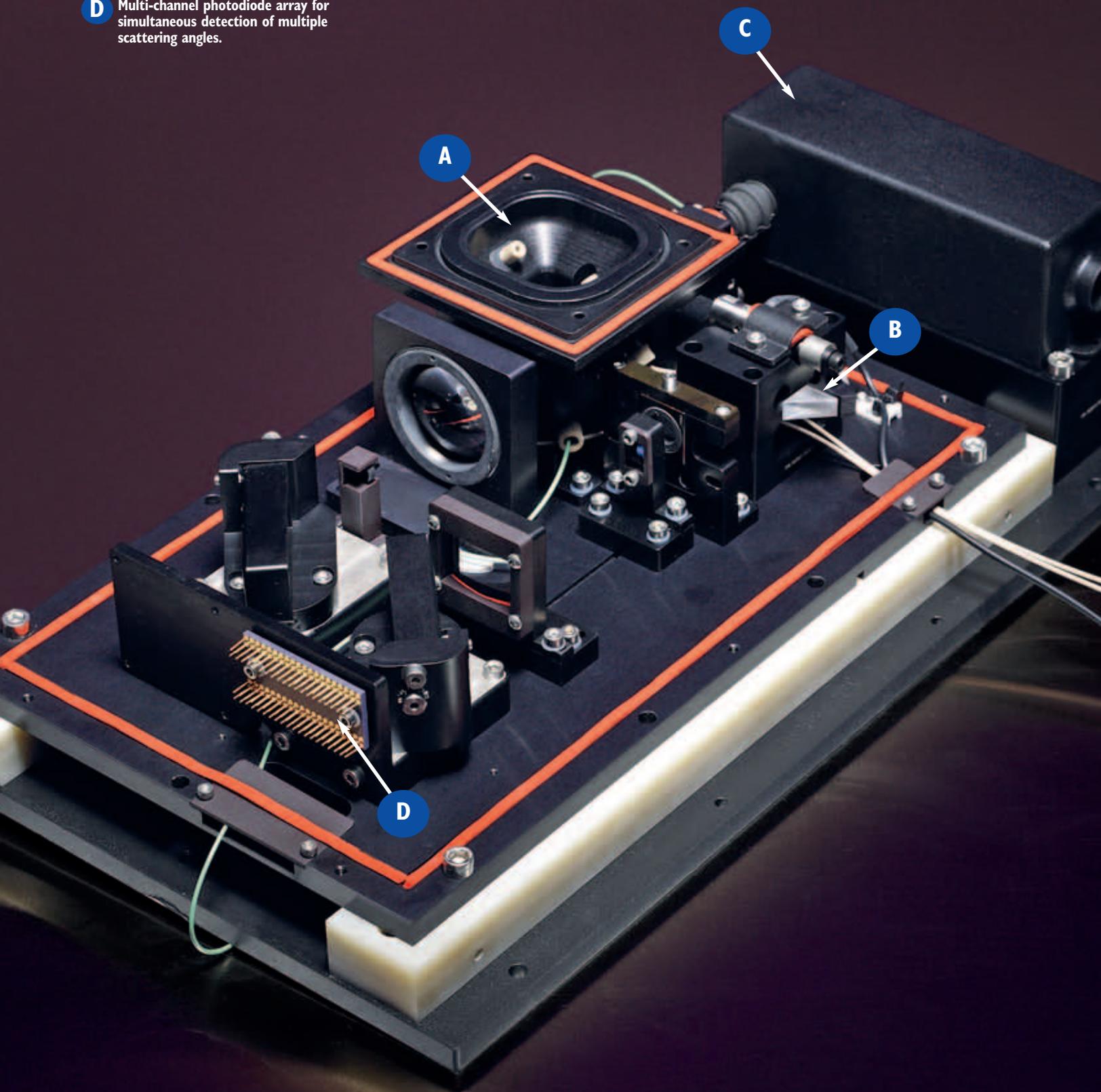
The Möbiuζ was designed to hold convenient, disposable cells for both mobility and DLS experiments—without sacrificing data quality.

with unique information. Together, they offer insight into the effective charge of your sample, utilizing the most appropriate formalism applied to the calculation of zeta potential (e.g. Smoluchowski's, Huckel's, and Henry's equations).

The Möbiuζ comes standard with precise temperature control for programmable thermal studies over the range of 4°C to 70°C, utilizing a novel peltier-based design for stability analysis, or to study changes in size, zeta potential, or isoelectric points.

There are two cell options for Möbiuζ. Reusable PEEK (Polyetheretherketone) cells come with replaceable platinum-coated electrodes and optical quality windows. Disposable cells are made of COC (cyclic olefin copolymer) for its superior optical quality and chemical inertness. Both cell types support simultaneous mobility and DLS measurements without sacrificing data quality. For labs requiring the highest levels of productivity for sample characterization, the Möbiuζ interfaces with a wide range of automated sample systems including syringe pumps, auto-samplers, and Wyatt's auto titrator.

- A** Integrated flow cell assembly for re-useable and disposable cells.
- B** Piezo prism assembly for phase modulation.
- C** Laser light source with long coherence length.
- D** Multi-channel photodiode array for simultaneous detection of multiple scattering angles.



# The Technology of the Möbiuζ

**Massively Parallel Phase Analysis Light Scattering (MP-PALS) captures more information, allowing measurement of samples as small as 1 nm.**

**A**s a non-invasive method, laser light scattering is prized for its ability to carry out physical, first-principle measurements of macromolecular electrophoretic mobility. However, traditional commercial instruments have hit a wall, trying to characterize proteins and other nanoparticles less than 5 nm. The invention of Massively Parallel Phase Analysis Light Scattering (MP-PALS) shatters this barrier and extends the measurable sample size down to 1 nm.

The smaller the particles, the more the Brownian motion masks the electrophoretic motion. With old technology, users have tried to average away this diffusional component by measuring for a long time, with large applied voltages—up to 150 volts! In the process, fragile molecules, like proteins, are irreversibly damaged and degraded, rendering the efforts futile. Moreover, as the solution ionic strength increases, the measurement becomes even more challenging. High current is required to drive measurable electrophoresis and gives rise to a host of problems. Old technology instruments “cook” the samples onto electrodes and cause profuse electrolysis of the mobile phase, rendering gas bubbles.

## The Secrets of the Möbiuζ...

Wyatt Technology’s Möbiuζ has rewritten the book on electrophoretic mobility and zeta potential measurements. The secrets of the Möbiuζ begin with the implementation of a free-space interferometer. The laser beam is split into a sample beam and a reference beam. The sample

beam is scattered by the moving particles, is collimated, and is recombined with the reference beam onto an array of photodetectors, each one of which makes an independent measurement of the mobility. This technique is called MP-PALS. The signals from the array elements are processed in real time with a proprietary demodulation algorithm. The photodetector array has an extraordinary dynamic range, which allows it to take advantage of a phenomenon known as coherent amplification in which the intensity of the reference beam is made more than 100,000 times larger than the

measurable molecular size range of zeta potential measurements to molecules as small as 1 nm. The multiple detectors used in the Möbiuζ efficiently average away the effect of Brownian motion and reveal the electrophoretic velocity, even with low applied voltages. For this reason, the Möbiuζ can accurately measure mobility with an applied voltage fewer than 3 volts, although it is also capable of generating high fields suitable for samples in (non-conducting) organic solvents.

Another secret of the Möbiuζ: the electrodes are only 1.6 mm apart. Such a narrow gap reduces required sample volume, decreases the required applied voltages, and prevents sample degradation. Sample preparation is easy as well. In batch mode, all you need to do is fill the cell, insert it into the temperature-controlled chamber and start collecting data. Our versatile flow-through cell design also allows connection to autosamplers, making a wide range of applications possible: the determination of electrophoretic mobility and zeta potential as a function of pH, ionic strength, and ligand concentration, etc.

By extending the *lower* limits of its size range, avoiding the use of abnormally high concentrations, applying gentle electric potentials, and providing ultra-high sensitivity and low sample volumes, the Möbiuζ can help turn questions about your proteins and nanoparticles into answers.

**The secrets of the Möbiuζ begin with its coherent laser amplification and multi-detector array technology, a.k.a. Massively Parallel Phase Analysis Light Scattering.**

**The Möbiuζ contains one of the most significant performance improvements in the technology: extending the measurable molecular size range of zeta potential to as small as 1.0 nm.**



**The easy-to-use integrated flow cell assembly has a low volume, which reduces the amount of sample required.**

sample beam. This greatly amplifies the signal from the scattered light so that even a single array element in the Möbiuζ outperforms any existing instrument...and it has 30 of them, giving an overall improvement in sensitivity of more than an order of magnitude.

These inventive concepts are responsible for one of the most significant performance improvements in the technology: extending

**Measuring nanoparticles’ mobilities has never been easier or faster!**

## The Theory behind the Möbiuζ

Electrophoresis is the migration of macromolecules under the influence of an electric field. The electrophoretic mobility  $\mu_E$  is defined as

$$\mu_E = \frac{v}{E}$$

where  $v$  is the particle electrophoretic velocity, and  $E$  is the applied electric field. When illuminated by a laser beam, the migrating particles cause the scattered light to be Doppler shifted, as illustrated in the accompanying figure. The scattered light can be red- or blue-shifted depending on the direction of the particle migration. The Möbiuζ measures the Doppler frequency shift  $\Delta f$  of the scattered light which is related to  $v$  by:

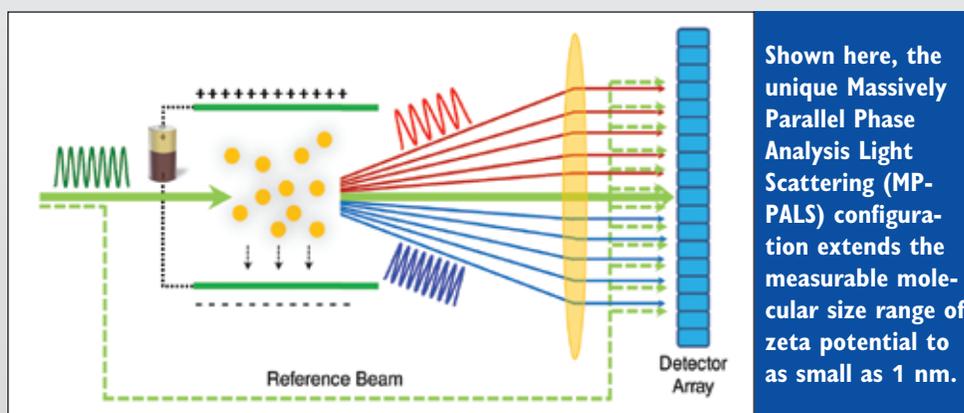
$$\frac{\Delta f}{f} = \frac{n_0 v}{c}$$

where:

$c$  is the speed of light in vacuum.

$n_0$  is the solvent refractive index.

$f$  is the frequency of the incident light.



It is worth pointing out that the Doppler shift  $\Delta f$  is tiny compared with the light frequency  $f$  ( $\Delta f/f \leq 0.00000000001!$ ), but the Möbiuζ accurately determines it by monitoring the interference pattern between the scattered light and the reference beam in our unique MP-PALS configuration. Acquiring signals at multiple angles simultaneously, MP-PALS averages away the effect of particle diffusion, producing reliable measurements. This is essential when it comes to measuring the mobility of small and weakly scattering particles, such as proteins.

With the WyattQELS™ option, the particle hydrodynamic radius  $r_h$  can be simultaneously measured and the effective charge  $Z^*e$  of the particle is computed through the relationship:

$$Z^*e = 6\pi\eta r_h \mu_E \frac{1 + \kappa r_h}{f_1(\kappa r_h)}$$

where  $\eta$  is the solution viscosity,  $\kappa$  is the inverse Debye length and  $f_1(\kappa r_h)$  is Henry's function\*.

Zeta potential,  $\zeta$ , is another parameter which can be derived from the measured mobility. In the limiting case where the hydrodynamic radius is much larger than the thickness of the ionic double layer, Smoluchowski's equation is used:

$$\zeta = \frac{\eta \mu_E}{\epsilon_r \epsilon_0}$$

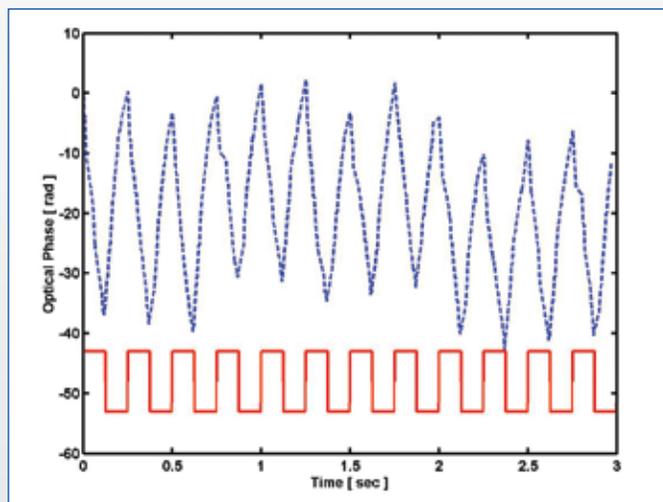
where  $\epsilon_r$  is the solvent dielectric constant and  $\epsilon_0$  the vacuum permittivity.

In the other limiting case where  $r_h$  is much smaller than the double layer thickness, Hückel's equation is used instead:

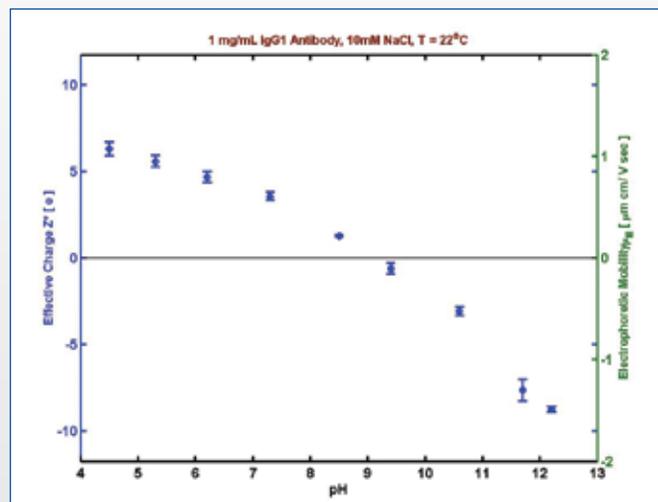
$$\zeta = \frac{3\eta \mu_E}{2\epsilon_r \epsilon_0}$$

\* C. Tanford, *Physical Chemistry of Macromolecules*, Wiley, New York, 1961.

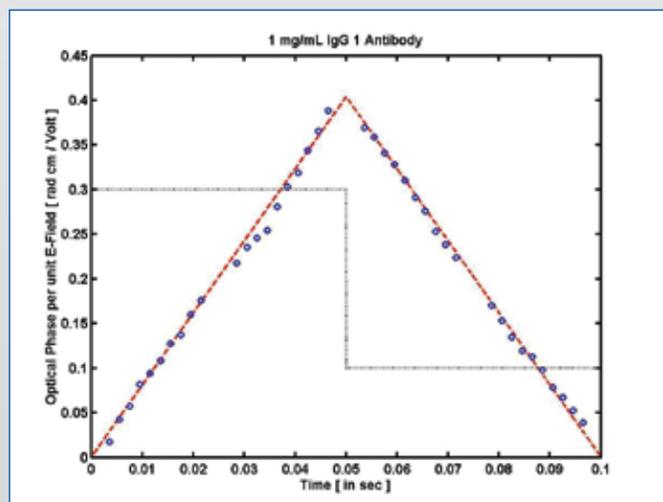
# Dynamics® Software



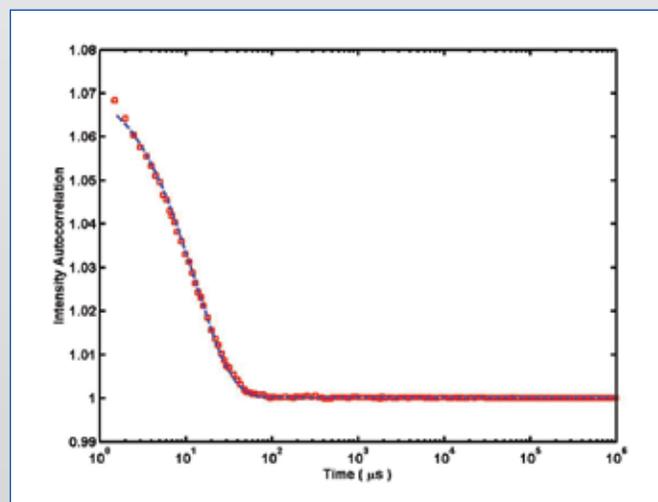
A square-wave electric field is applied to drive the electrophoresis of polystyrene latex particles ( $R_h = 50\text{nm}$ ) in 5mM NaCl. The electric field is plotted below the measured optical phase for reference. The electrophoretic movement reverses direction every time the electric field switches polarity.



Measurement of *protein* electrophoretic mobility as a function of formulation pH. The isoelectric point is determined as 9.1, in agreement with prediction based on its amino acid sequence. The effective molecular charge at each pH value is also shown.



The average measured optical phase of an antibody sample at a concentration of 1 mg/mL. The measured sample mobility is  $+0.84 \mu\text{m}\cdot\text{cm}/\text{V}\cdot\text{sec}$ . Since the proteins are positively charged, they move in the direction of the electric field and reverse their migration with the applied electric field.



The intensity autocorrelation function obtained for 0.2 mg/mL bovine serum albumin. With the embedded WyattQELS™ option, one can measure the sample hydrodynamic radius and estimate the molar mass utilizing any one of three shape models for macromolecules, including isotropic spheres, Rayleigh spheres and random coils.

Sample	Möbiuζ Results		Literature Values		Note
	Mobility m-cm/V-sec	Zeta Potential mV	Mobility m-cm/V-sec	Zeta Potential mV	
IgG1 Antibody (I), 1 mg/mL	$+0.32 \pm 9\%$	$+5.8 \pm 9\%$	$+0.35$	$+6.3$	Reference <sup>1</sup>
IgG1 Antibody (II), 1 mg/mL	$+0.59 \pm 8\%$	$+10.7 \pm 8\%$	$+0.58$	$+10.5$	
IgG1 Antibody (III), 1 mg/mL	$+0.84 \pm 7\%$	$+15.2 \pm 7\%$	$+0.75$	$+13.6$	
BSA, 1 mg/mL	$-1.65 \pm 9\%$	$-30.4 \pm 9\%$	$-1.70$	$-31.3$	Reference <sup>2</sup>
Polystyrene Latex Particles	$-4.20 \pm 4\%$	$-53.3 \pm 4\%$	$-4.00 - -4.40$	$-50.8 - -55.9$	Reference <sup>3</sup>
NIST SRM1980	$+2.53 \pm 5\%$	$+32.1 \pm 5\%$	$+2.59$	$+32.9$	Electrophoretic Mobility Standard

<sup>1</sup> Champagne, J. C. Ph.D. Dissertation *Addressing the Opalescence/Aggregation Relationship of an IgG 1 Antibody*. 2009.

<sup>2</sup> Menon, M. K. and Zydney, A. L. *Anal. Chem.* 1998, 70, 1581–1584.

<sup>3</sup> Gittings, M. R. and Saville, D. A. *Langmuir* 1995, 11, 798–800.

# Additional Products & Applications

Wyatt Technology provides the ideal instruments for comprehensive characterization of macromolecules and nanoparticles.

## Multi-Angle Light Scattering (MALS)

The MALS family of instruments includes the DAWN HELEOS® and miniDAWN TREOS®. These instruments measure the absolute molar mass, size, and shape of macromolecules in solution. They may be used in batch mode (off-line) or connected on-line to an HPLC/FPLC/AFFF, etc. Each instrument contains connections and on-board digital signal processing hardware for four external devices. The HELEOS II has 18 detectors for unparal-



The DAWN® HELEOS® II is the ultimate in a research-oriented light scattering instrument. Its 18 angles of detection give it the widest angular range of any commercially-made light scattering detectors, and its numerous options enable it to be customized for practically any application.

leled multi-angle measurements (from a low angle of about 10° to a high angle of almost 180°), a 120mW GaAs linearly polarized laser, and options for a variety of thermostatic-control systems to go up to 210°C or as low as -15°C.

## Optilab T-rEX

The Optilab T-rEX (refractometer with EXTended range) is an RI detector that has 256 times the detection power and up to 50 times the dynamic range of



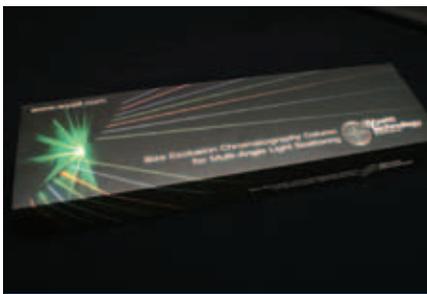
Wyatt's Optilab T-rEX™ has 256 times the detection power and up to 50 times the dynamic range of any other RI detector.

any RI detector in existence today.

The Optilab T-rEX may also be used to measure the absolute refractive index increment,  $dn/dc$ , at the same wavelength as the light scattering instrument. Finally, the Optilab may be used to measure the absolute refractive index of a solution.

## SEC Columns for Multi-Angle Light Scattering

Wyatt's new silica based columns are specifically designed for SEC-MALS protein applications. They are made of the highest quality silica with well-controlled

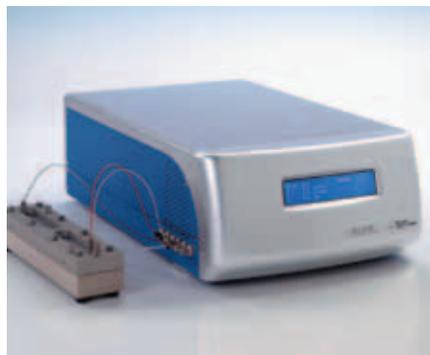


Wyatt SEC columns provide high resolution, extended lifetime, excellent lot-to-lot reproducibility, and a full range of pore size selections.

pore size and highly reproducible surface chemistry. As a result, WTC columns provide high resolution, extended lifetime, excellent lot-to-lot reproducibility, and a full range of pore size selections. Moreover, these columns have exceptionally low light scattering baseline noise and better pressure shock resistance than any comparable columns on the market.

## Wyatt Eclipse

The Eclipse system brings a powerful sub-micron particle separation technology to your lab in the form of Asymmetric-Flow

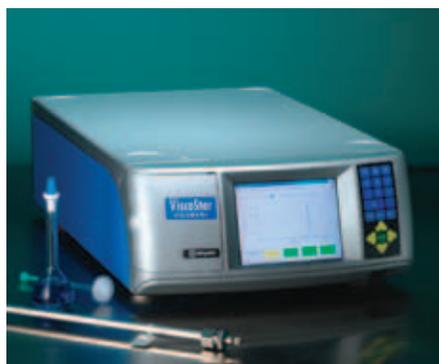


The Wyatt Eclipse™ is the ultimate system for separating macromolecules, proteins, colloids, and nanoparticles.

Field Flow Fractionation (AF4). It integrates perfectly with Wyatt's DAWN HELEOS and Optilab T-rEX instruments to measure submicrometer particles and their distributions in solution.

The AF4 system may also separate macromolecules, such as proteins. The AF4/MALS technique is a key orthogonal technique (along with SEC-MALS and AUC) for identifying and quantifying protein aggregates in solution.

# Additional Products



The ViscoStar® II represents a new generation of online differential viscometers.

## ViscoStar®

The ViscoStar represents a new generation of online differential viscometers that is designed with a traditional four-arm “bridge” arrangement. The uniqueness of the ViscoStar springs from its high accuracy and contemporary electronics. It achieves at least twice the signal-to-noise ratio of any commercial viscometer currently on the market, and it incorporates a high efficiency heat exchanger to provide extremely stable baselines.

## Dynamic Light Scattering (DLS)

When you want to have the best of both worlds (classical and dynamic light scattering), our MALS instruments can be ordered with the embedded WyattQELS™, or they can interface with our DynaPro™ NanoStar®. The combined instruments allow simultaneous static *and* dynamic light scattering measurements from which both absolute molar masses and hydrodynamic radii can be obtained.

## DynaPro NanoStar

The DynaPro NanoStar DLS instrument is used predominantly in batch mode for the analysis of the size, aggregation and thermal stability of protein solutions, biomolecules, colloids, small molecule aggregates, buffers or other macromolecules or

nanoparticles in solution. New specially-designed cuvettes allow one to use as little as 1  $\mu\text{L}$  of sample!

The NanoStar produces more than twice the signal-to-noise of its predecessor. The DynaPro now has a built-in autoattenuator and temperature control up to 150°C! Even a dedicated static light scattering detector has been built into the NanoStar, so that it can measure not only hydrodynamic radii of a given sample, but also its absolute molar mass.

## DynaPro™ Plate Reader™

The DynaPro Plate Reader incorporates state of the art technology, providing superior high throughput DLS perfor-



The DynaPro™ NanoStar® can be used for nanoparticle and protein size determination, with sample volumes down to 1  $\mu\text{L}$  and a temperature range from 4-150° C.

mance. The non-invasive and “dry” technology measures samples directly from industry-standard microplates (96, 384, or 1536 well plates) using as little as 1.5  $\mu\text{L}$  of sample per well. After the plate is loaded into the DynaPro, the data are collected automatically—in an unattended manner—by the easy-to-use DYNAMICS® Software, which also supports full integration with industry leading liquid handling robotics. Once the data are collected, the samples can be recovered and the plates discarded—no cleaning required! The DynaPro Plate Reader will help you



DynaPro™ Plate Reader™ is the most popular automated DLS instrument for the highest levels of reproducibility on the market.

increase your productivity by a factor of 10 or more when sizing biomolecules and other nanoparticles compared to conventional batch DLS systems.

## Calypso™

The new Calypso system simplifies the task of preparing batch samples for light scattering analyses. The Calypso's proprietary software automatically prepares sequential dilutions required to measure the composition and concentration dependence of light scattering measurements for the analysis of self- and hetero-associations and the measurement of kinetics.



Calypso™ may be used to study the equilibrium and kinetics of reversible self- and hetero-association of proteins, as well as to measure virial coefficients.

# Service & Support

## World-class service and support from the leading developer of light scattering instrumentation.

The founders of Wyatt Technology commercialized the first light scattering instruments incorporating lasers more than 40 years ago. It's no surprise that today, we're the world leader in the field. No instrumentation developer has greater resources devoted to the manufacture, service, and support of light scattering instruments than we do. We have more post-graduate degreed scientists involved in the support of this type of equipment than all of the other firms in the business *combined*. In fact, our company has more than 300 *person-years* of cumulative experience in light scattering.

We're proud to offer our unique Light Scattering University® course that includes three days of intensive hands-on training in Santa Barbara, California. The curriculum covers light scattering theory, data collection and analysis, troubleshooting, and maintenance. During training, our customers interact with the people who develop our software and hardware.

Customers learn not only about hardware and software operation but also about sample preparation and data interpretation. Our internationally-acclaimed immersion training also insures that operating the instruments will be second nature by the time the course is done.

When questions do arise, our superb staff answers telephone, fax, and e-mail

inquiries quickly. By means of our interactive customer support, our service personnel are always just a phone call away, and a proprietary Internet link can bring us directly into your lab for "hands-on" help and guidance with our Remote Assistant support feature.

Since the company has so many biotechnology, pharmaceutical, and polymer customers, we have developed complete IQ-OQ service packages, which are available with on-site support. Our International Light Scattering Colloquium is held once a year to stimulate the exchange of information among

our customers and to promote greater understanding of the capabilities of MALS and other technologies developed by Wyatt. All of Wyatt Technology's customers are eligible to attend and participate in this colloquium that is often called the most interesting scientific conference around.

The company also maintains an online Support Center where customers can view their instrument ser-

vice status, download current software updates, read our Frequently Asked Questions, and order spare parts and supplies from the on-line store. Our Website provides frequent additions to its extensive bibliography of thousands of refereed scientific papers that have utilized Wyatt instruments, training schedules, and Application Notes. You can



**WWW.WYATT.COM** is the home of light scattering instrumentation. The site includes over 180 Application Notes, more than 6000 known peer-reviewed publications using Wyatt instruments, all upcoming Light Scattering University training schedules, a variety of Light Scattering Seminar schedules, where customers may view their current instrument service histories, download software updates, view both live and archived webinars on a variety of topics, read new FAQs, and order spare parts and supplies.

### AUSTRALIA/NEW ZEALAND

Tel: 61 2 9898 2444

Fax: 61 2 9684 4055

e-mail: john.hewetson@shimadzu.com.au

### AUSTRIA/GERMANY/SWITZERLAND

Tel: 49 2689 925 100

Fax: 49 2689 925 299

e-mail: info@wyatt.eu

### CHINA

Tel: 8610 822 92806

Fax: 8610 822 90337

e-mail: daijie@wyatt.com.cn

### FRANCE

Tel: 33(0)5 3455 9928

Fax: 33(0)5 6720 6474

e-mail: nmignard@wyatt.com

### INDIA

Tel: 91 44 2431 5030

Fax: 91 44 2434 0761

e-mail: info@spincotech.com

### ISRAEL

Tel: 972 3 937 1120

Fax: 972 3 937 1121

e-mail: bensie@eldan.biz

### ITALY

Tel: 39 10 469 9369

Fax: 39 10 469 9377

e-mail: info@alfatechspa.com

### JAPAN

Tel: 81 3 3459 5101

Fax: 81 3 3459 5081

e-mail: ei.tsuruta@shoko-sc.co.jp

### KOREA

Tel: 82 2 2644 1991

Fax: 82 2 2644 2478

e-mail: is@insung.net

### NORTH/SOUTH AMERICA

Tel: (805) 681 9009

Fax: (805) 681 0123

e-mail: info@wyatt.com

### SPAIN/PORTUGAL

Tel: 33(0)5 3455 9928

Fax: 33(0)5 6720 6474

e-mail: nmignard@wyatt.com

### SWEDEN/NORWAY

Tel: 46 18 303500

Fax: 46 18 4773276

e-mail: tsandberg@wyatt.com

### TAIWAN

Tel: 886 2 8227 8822

Fax: 886 2 8227 8811

e-mail: wp4713@ms8.hinet.net

### TURKEY

Tel: +90 216 3256747

Fax: +90 216 3256566

e-mail: guran@infokimya.com

### UNITED KINGDOM

Tel: 44 1440 709447

Fax: 44 870 460 1598

e-mail: kjackson@wyatt.com

# Specifications

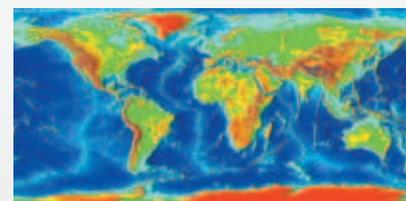
<b>Light Source:</b>	50 mW diode pumped solid state (DPSS) single-longitudinal-mode laser
<b>Laser Wavelength:</b>	532 nm, other wavelengths available upon request
<b>Laser Lifetime:</b>	> 10,000 hours
<b>Detectors:</b>	30 detector channels for multi-angle detection
<b>Detector type:</b>	Multi-element photodiode array for mobility measurements; Single photon counting module for QELS option
<b>Instrument Options:</b>	Embedded Quasi-Elastic Light Scattering (QELS)
<b>Cell Options:</b>	Reusable PEEK flow cell with optical quality windows for aqueous and organic solvents Disposable COC* cell for aqueous and polar organic solvents
<b>Flow Cell Volume:</b>	170 $\mu$ L, excluding tubing
<b>Disposable Cell Volume:</b>	170 $\mu$ L, excluding tubing
<b>Temperature Range:</b>	4 - 70°C
<b>Electrodes:</b>	(Replaceable) Platinum-coated electrodes
<b>Molar Mass Range:</b>	< $5 \times 10^7$ g/mol (Daltons) (dependent on molecular shape model)
<b>Size Range:</b>	0.3 to 1000 nm, hydrodynamic radius (limited by particle sedimentation, this is typical)
<b>Signal Processing:</b>	Proprietary demodulation algorithm for efficient optical phase detection
<b>Inputs/Outputs:</b>	Alarm in, alarm retransmit, and remote start contact closure
<b>Ionic Strength Range:</b>	0 - 50 mS/cm (4 times the conductivity of physiological saline)
<b>Mobility Range:</b>	No practical limit
<b>Mobility Size Range:</b>	1 nm - 1 $\mu$ m (depending on sample)
<b>Mobility Sensitivity:</b>	1 mg/mL Lysozyme †
<b>Communications:</b>	Ethernet interface
<b>Front Panel Display:</b>	162.5mm 16-bit high resolution LCD display with Graphical User Interface
<b>Power:</b>	200 W typical, 400 W maximum
<b>AC Voltage:</b>	90 - 250V @ 50 - 60 Hz, universal power input
<b>Dimensions:</b>	59 cm (L) x 36 cm (W) x 21 cm (H); 23" x 14" x 8"
<b>Weight:</b>	19 kg (41 lbs.)

\* Cyclic olefin copolymer (COC) is chosen for its chemical inertness, wide temperature range, and superior optical quality.

† Solvent is 2.5 mM phosphate buffered saline. The standard deviation from ten thirty-second measurements is 10% of the mean value.

Wyatt Technology has a policy of continual improvement. Specifications subject to change without notice.

**Warranty:** All Mobius instruments are guaranteed against fabrication defects for twelve months. Should any unit become defective due to normal use within the warranty period, we will repair or replace it at no charge.



With installations in *more* than 50 countries, Wyatt Technology is the **world's leading manufacturer of instruments** for absolute macromolecular characterization. It is the only company in the world focused exclusively on such systems, their design, and their application.

DAWN, HELEOS, TREOS, Optilab, ViscoStar, ASTRA, DYNAMICS, Light Scattering University, Light Scattering for the Masses, Wyatt Technology, and the Wyatt Technology logo are registered trademarks of Wyatt Technology Corporation. Wyatt Technology instruments, components and software are covered by one or more of the following: U.S. Patent Nos.: 5,404,217; 5,475,235; 5,528,366; 6,411,383; 6,426,794; 6,452,672; 6,519,032; 6,651,009; 6,774,994; 6,819,420; 6,975,392; 7,027,138; 7,283,221; 7,331,218; 7,386,427; British Patent Nos.: EP 0 710 831; EP 0 665 433; EP 1 134 577; EP 1 510 807; EP 1 538 435; German Patent Nos.: 694 30 918.4-08; 694 33 615.7-08; 601 31 486.7-08; 603 19 078.2-08; 60 2004 022 625.4-08; Japanese Patent Nos.: 3,580,380; 4,346,694; 4,439,211; 4,381,914; 4,426,951. Chinese Patent Nos.: ZL 95 1 01046.8; ZL 2004 1 0080545.4; Korean Patent No.: 794,478. Other patents pending. No part of this brochure may be reproduced in any way without written permission from Wyatt Technology Corporation.

© 2010 Wyatt Technology Corporation  
W5200A



6300 Hollister Avenue  
Santa Barbara, CA 93117 USA  
Tel: 805/681-9009 • Fax: 805/681-0123  
e-mail: [info@wyatt.com](mailto:info@wyatt.com)