

ZETAVIEW®



LASER SCATTERING VIDEO MICROSCOPE



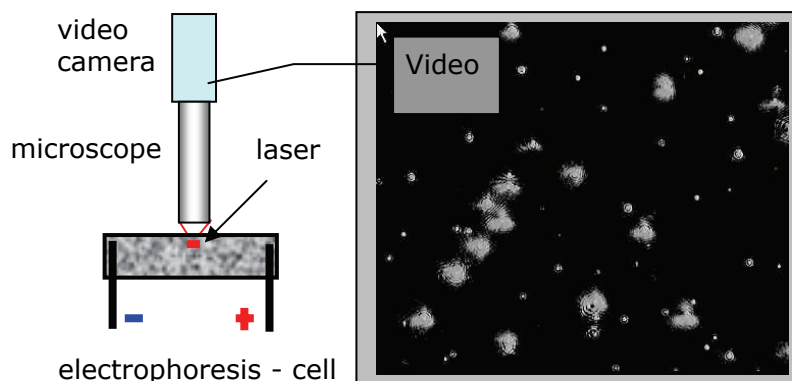
With the ZETAVIEW® the classical micro-electrophoresis has a modern tool to study the interface behaviour of colloid particles. "Seeing is believing" is the principle of the ZETAVIEW® visualising both, the electrophoretic and Brownian motion in a laser scattering microscope. Multimodal Zetapotential- and size- histograms can be derived from the analysis of thousands of individual particles in a routine way. The overall size ranges from 80 nm to 10 µm.

Applications are:

Ceramics & glass, cement, coating materials, emulsions, filling materials, food & beverages, inks, pigments, polymers, proteins, silica,.

ELECTROPHORESIS AND BROWNIAN MOTION

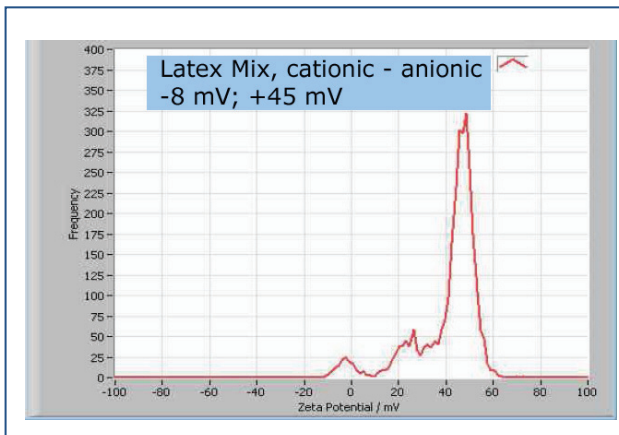
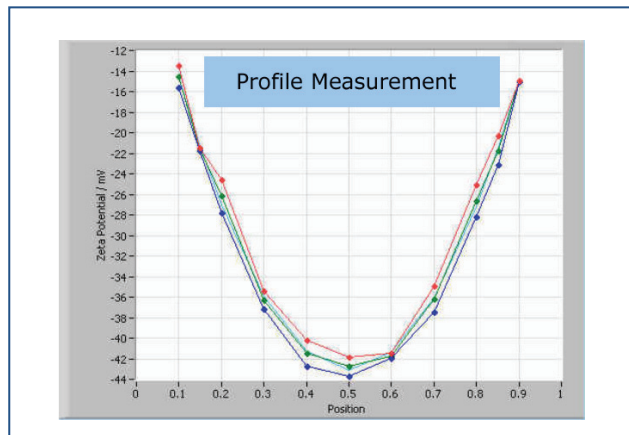
To capture the movement of fine particles in an electrophoresis cell a laser scattering microscope with video camera is used. The electrophoretic mobility and the Smoluchowski Zetapotential are derived from the measurement of the particle velocity distribution. Following the Stokes Einstein formula the Brownian motion of the particles is analysed for particle size distributions.



TECHNICAL

Laser light is directed into the focal point of a microscope lens at a 90 angle. The intensity of scattered light of illuminated particles is such that 80 nm sized polystyrene latex particles are still visible. Upper and lower measurement limits depend on the material, the upper being 10 µm. By automatically controlling the optics the electrophoresis movement is easily separated from the competitive electro-osmosis effect. Conductivities bigger than 1mS/cm may cause convection within the cell. This and other disrupting effects like drifts are detected through the video camera. This „Seeing is believing“ – principle is a major advantage over comparable techniques.

The mobility profiles and the mobility at the two stationary layers deliver comparable Zetapotential values. The mobility profile reveals more of the sample condition quality, whereas high resolution Zetapotential distributions can be obtained from the measurement at the stationary layers.



VALIDATION

The method relies on first principles and can therefore be easily validated. Each automatic measurement can be verified by visual single particle measurements.

SPECIFICATIONS

Measurement cell:	Fused silica channel, end cylinder in Peek, Platinum electrodes
Applied cell voltage:	- 24 V to + 24 Volt
Optical System:	Laser 650 nm, 5 mW, microscope lens x 10 and digital camera
Zetapotential range:	-100 to + 100 mV
Range of particle size:	0.1 to 10 µm for ZP. Lower and upper limit dependent on sample 0.1 to 1 µm for particle size distributions
pH-range:	2 to 12
Temperature range:	10°C to 35°C
Conductivity range:	0.01 to 1.5 mS/cm
Accuracy of measurement:	+/- 10% (Standard sample)
Reproducibility:	+/- 5% (Standard sample)
Samples:	aqueous dispersions, highly diluted (depending on size)
Test standards:	Alignment sample and Zetapotential standard
Electrical supply:	110 to 230V, 50-60 Hz, 30VA
External dimensions:	20 (W) x 25 (H) x 30 (D) cm
Weight:	main unit 9 kg, notebook 3 kg
Measurement software:	System control, autoalignment, measurement of single particles, ZP distributions, mobility profiles, Size distributions.
Theory:	Conversion of electrophoretic into Zetapotential according to Smoluchowski equation. Size distribution following Stokes Einstein formula
Material parameters:	No material parameters required.
Data management:	Video files, txt files, pdf reporting, single and overlay output

ACCESSORY

WTW pH/cond 340i:	for pH, conductivity and temperature. Automatic import of parameters into the ZetaView® software
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