Nanoparticle Tracking Analysis **with Zeta Potential and DLS Capability**	**Category: C. Particle Characterizations in and ex-situ** **Institute: VITO** **Location: Industriezone Vlasmeer 7, 2400 Mol, Belgium** **Contact Details of Technology Expert:** **Inge Nelissen** **Phone: +32 (0)14 335211** **Fax: +32 (0)14 582657** **E-mail: inge.nelissen@vito.be**

Short technology description/Overview:

The **NanoSight NS500-HSGFZ Instrument** provides an easy-to-use, reproducible platform for real-time **Nanoparticle Tracking Analysis** (NTA). With the NS500 you can analyse the presence, size distribution, concentration and fluorescence of all types of nanoparticles from 10 nm to 1000 nm depending on the instrument configuration and sample type.

Samples are introduced into the viewing chamber using the on-board fluidics capability. On-screen pump control allows for automatic sample handling, including loading, washing and dilution. Computer-controlled motorised optical stages enable rapid relocation and refocussing following cleaning, improving reproducibility. Sample temperature is fully programmable through the NTA Software Suite.

The "**ZetaSight**" top plate allows an electric field to be applied to a nanoparticle sample suspended in an aqueous solution. The electro-phoretic velocity, and hence the electro-phoretic mobility of the particles can be measured.

NanoSight **Dynamic Light Scattering** (DLS) allows DLS and NTA data to be recorded on the same sample, within the same instrument. The automated stage of the NS500 allows quick and easy interchange between preset DLS and NTA data collection points. The addition of the DLS capability extends the lower detection limit of the NS500.

Main Features:

NTA size distribution, concentration measurement:

- Nanoparticle analysis range: typical 10 nm-1000 nm, dependent on scatter properties.
- All types of nanoparticles: ceramic and metallic nanoparticles, pharmaceutical nanoparticles-liposomes, viruses, carbon nanotubes (multi-walles), colloidal suspensions and polymer nanoparticles, cosmetics and foodstuffs, nanoparticles in fuels and oils (soot, catalyst, wax etc.), wear debris in lybricants, ...
- Solvent: any non-corrosive solvent and water. A range of solvent-resistant seals are available.
- Integrated focused, polarized and triggered green laser illumination (532 nm)
- On board temperature control (temperature range from 15°C to 55°C)
- Manual push/pull 565 nm long pass fluorescence filter for measurements of fluorescent nanoparticles against complete matrix background.
- Super high-sensitivity scientific CMOS camera
- Samples volume requirements: 300 µl
- Concentration: 10^7-10^9 particles/ml

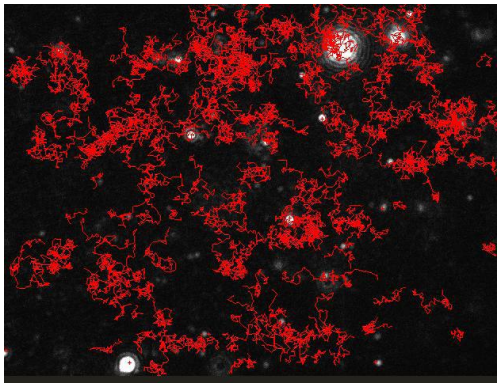
Zeta Potential measurement:

- Aqueous samples
- Minimum sample volume: 600 µl
- Conductivity: 5 µS/cm-20,000 µS/cm
- Concentration: 10^8-10^9 particles/ml
- Zeta Potential from -150 mV to +150 mV

DLS size distribution measurement:

- Minimum sample volume: 600 µl
- Particle size: < 5 nm to 1000 nm (depending on refractive index and concentration)
- Concentration: 10^8-10^{14} particles/ml

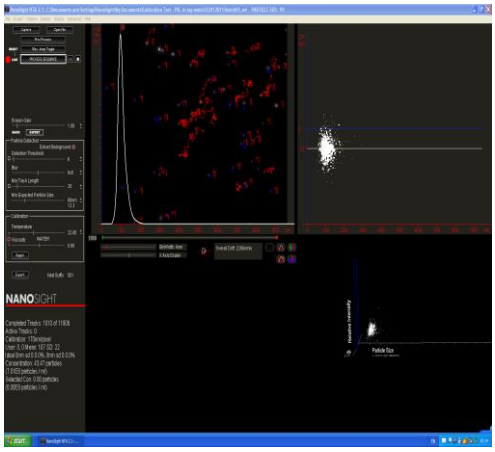
Typical Samples & Images:



NanoSight's nanoparticle tracking analysis uses Brownian motion to locate and follow individual particles in solution.

Image: Nanosight

Zeta potential:



NTA analysis of a recorded video after the electro-osmotic profile has been characterised. The scatter plot in the top right shows corrected electrophoretic velocities in white, plotted against particle size. Velocities are converted into zeta potential measurements by scaling according to sample properties.

Image: Nanosight

Any further Information: