

Characterization of nano scaled particle systems

Aello 1400

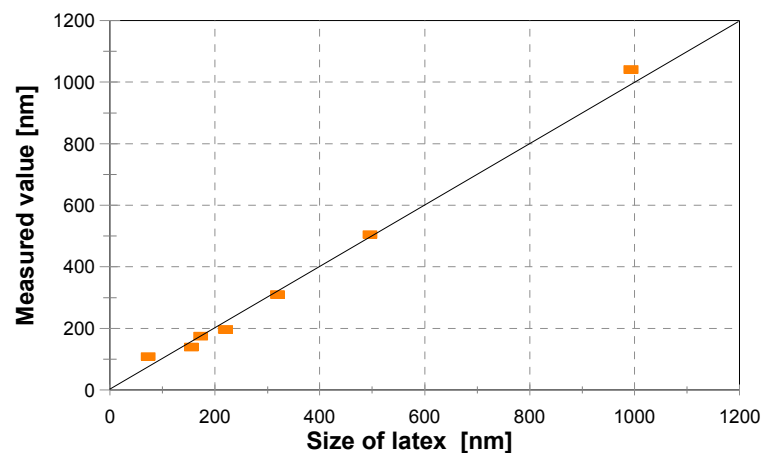
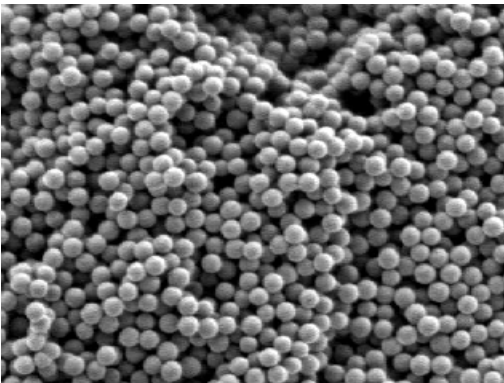
Description:

The in-situ sensor measurement system **Aello 1400** serves to characterize liquid disperse systems. Two different measurement principles - the dynamic and the spectral measurement of the light extinction - are integrated in this compact and user-friendly in-situ probes. By combining either measurement methods it is possible to characterize disperse systems from a few nanometers particle diameter up to some hundred micrometers by one device. The user can adapt the system to several measurement tasks by selecting different solution algorithms. A mean particle size and concentration as well as information about coarse particles can be detailed calculated. The measurement system is suitable for process monitoring, process optimization and quality control even in complex multiphase processes.

The application is applicable either in laboratory or on in-line production processes. To integrate the sensor flexible into several processes we also provide additional accessories like adapters, change fittings and stand alone units (for signal processing without a PC). Especially the in-situ concept has been tested in industrial practice comprehensively. It guarantees an uncomplicated integration and maintenance of sensors even during running processes.

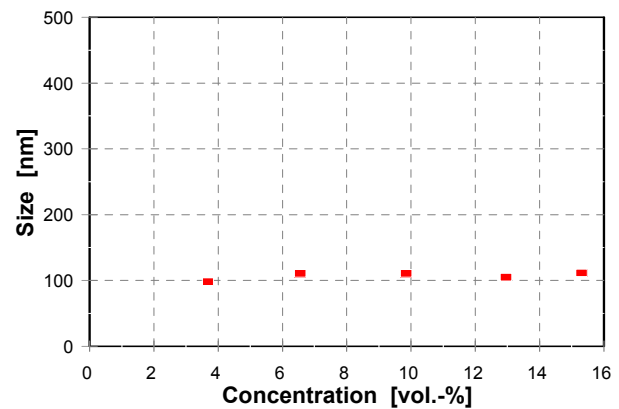
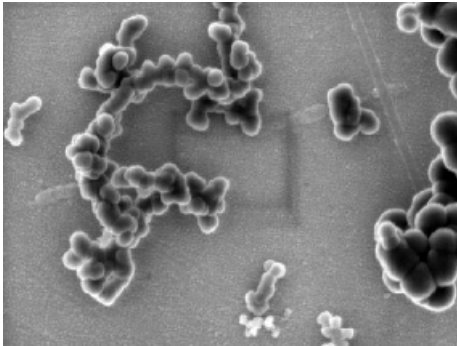
The following application samples give you an impression of the variety of use of the **Aello 1400**.

Accuracy of the calculated particle size in example of Latex:



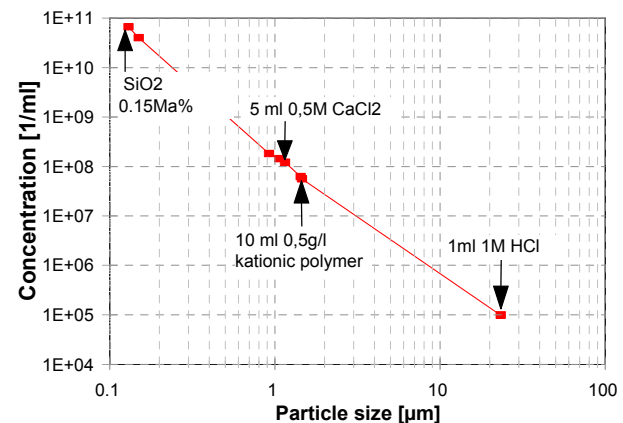
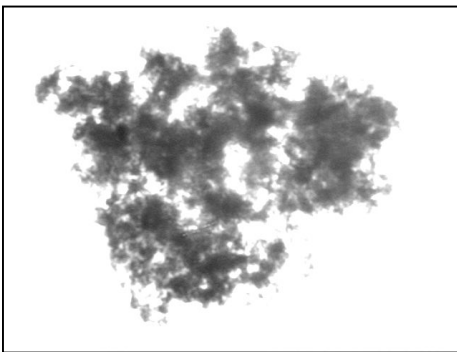
Standard particle systems are used to validate a new measurement system. Latex particles are common as standard for the characterization of sub micron particle sizes. The picture shows the spherical mono disperse particles. Using the **Aello 1400** measurement system different Latex standards were measured from 70 nm to 990 nm. The diagram shows on the one hand the particle size of a producer certified by German Industrial Standard (DIN) and the evaluated size by the measurement system on the other hand. The high congruence of the values over the whole range is considerable.

Investigation of particle sizes in different concentrations – pyrogenic silica



Especially for industrial applications it is always interesting to measure in the real process concentrations. However, nowadays there are only a few methods able to measure nano sized particles in high concentrations. The example shows the determination of the particle size of a pyrogenic silica as it is used in abrasives in the semiconductor industry. The concentration has been increased from less than a volume percent up to 15.5 vol. percent in the suspension during measuring. After that the measuring system has been applied directly in the mass-produced polishing slurry. An influence on the measured particle sizes by changing the concentration can not be proved.

Monitoring of process kinetic – flocculation of silica



Monitoring of changes in the process kinetics or the determination of nominal value for quality control is often required in practice. The example refers to the treatment of waste water. Nano particles has to be separated from the stream to reach a defined limit. For a successful mechanical separation a flocculating agent is added. The flocks are very porous-opened structures which can reach a size of several dozen of micrometers.

The flocculation process of different agents has been investigated extensively with the **Aello 1400** measurement system, backed by its wide measuring range. The measured number concentration describes the expected decrease by accumulation in the flocks. Furthermore it is possible to determine the porosity of flocks by using the values number concentration and size of flocks.