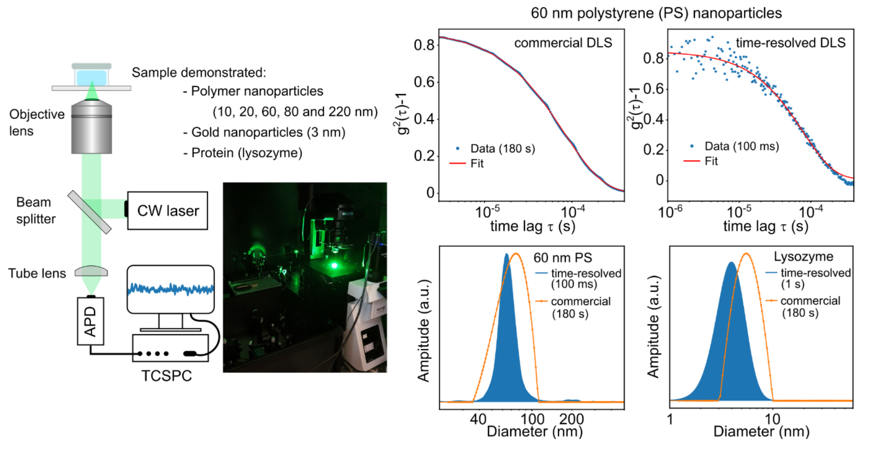
In-situ Particle size characterization system

Invention

The inventors have demonstrated that particle size and distribution in liquid suspensions can be determined with higher accuracy and speed by using a compact micro dynamic light scattering (µDLS) system featuring single-photon detection and advanced signal processing. This approach drastically reduces the integration time to just a few tens of milliseconds, compared to conventional instruments that require several minutes. It also enables real-time, in-situ observation of particle growth. The system is capable of detecting particles as small as a few nanometers.



Features & Benefits

- **Microscopic optical detection** – By reducing the focal volume, it becomes possible to measure particle sizes across a wide concentration range, while simultaneously minimizing the required sample volume to microliters.
- **Sensitive Single Photon-Detector** – allows very fast particle size tracking with a time resolution of a few tens of milliseconds.
- **Real-time correlation and processing algorithms** – Deliver fast, high-precision particle size distributions without requiring sample dilution.
- **Compact, modular design** – The system allows easy integration into analytical instruments or process lines, both in-line and off-line, enabling continuous monitoring. Its modular and flexible architecture further permits the incorporation of additional spectroscopic analysis modules.

Intellectual Property

Patent: Particle characterization system
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Technology Readiness Level

A compact lab machine (45 x 45 x 60 cm) has been built and ready to be used for various testing.

Applications

- **Pharmaceuticals**: Monitoring nanoparticle size in drug formulations and liposomes.
- **Biotechnology**: Characterization of proteins, vesicles, observation of liquid liquid phase separation and colloidal suspensions.
- **Materials science**: Quality control of pigments, emulsions, and polymer dispersions.
- **Process industries**: In-line, in-situ particle size monitoring during manufacturing or reaction.

Partnership sought

Exclusive or non-exclusive licensing to industrial partners able to develop and commercialize the technology.

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