BRAVE B-ELEMENTARY

The OF2i®-Raman lab device provides continuous determination of particle size, particle concentration and simultaneous chemical analysis of nanoparticles and microplastics in water.

This correlative OF2i®-Raman method has the potential to detect particles that are difficult to access by standard Raman microscopy (<500 nm). For the first time it is possible to identify materials like plastics, minerals and organic substances on a single-particle basis and with high sample throughput (up to 60 particles per minute).

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Benefits of OF2i® plus Raman analysis

- Minimum sample preparation
- Measurement of particles directly in liquids
- Continuous measurement over minutes and hours (in flow)
- High sensitivity for low particle concentrations
- Particle concentration, particle size and PSD measured with OF2i® (50 nm to 50 µm sample-dependent)
- Identification of nanoparticles (<1 µm) and micro-plastics (1 µm to 50 µm) using Raman spectroscopy

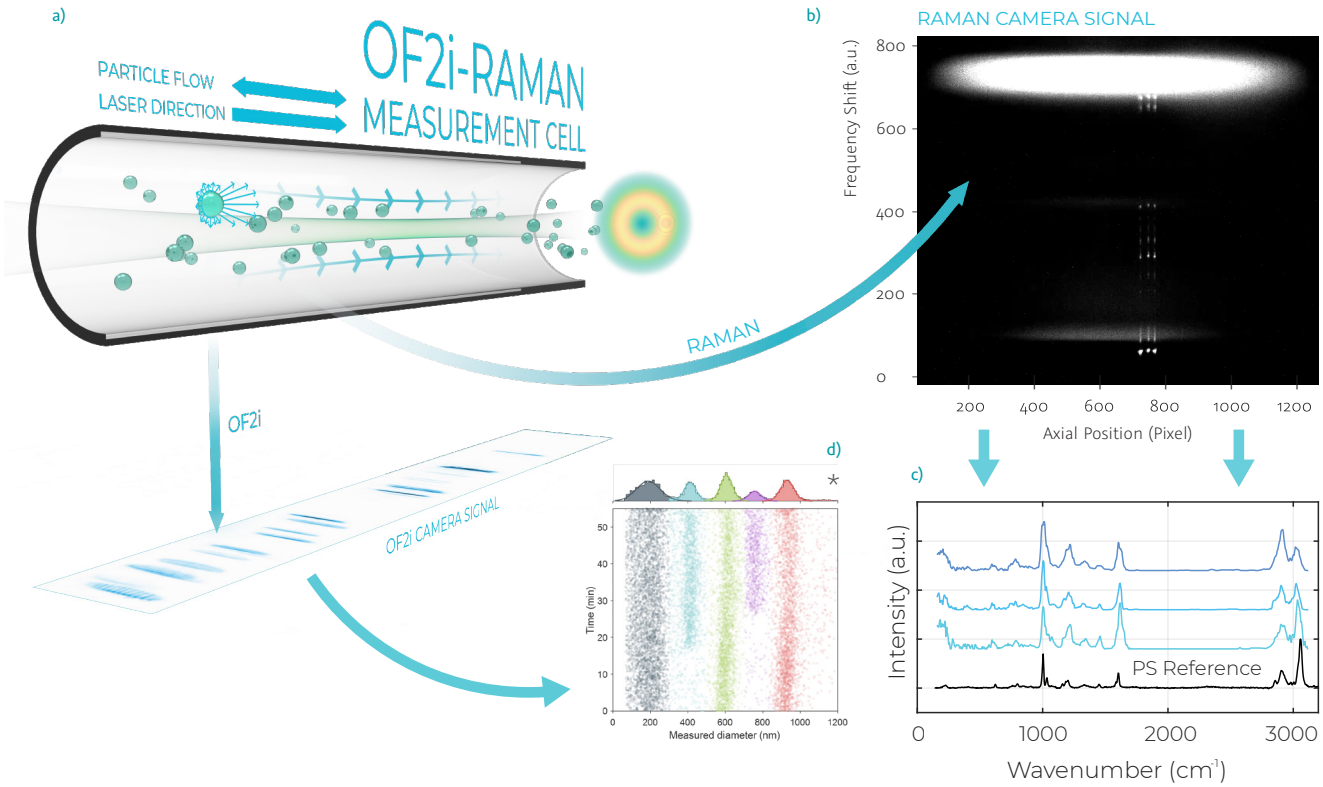

Figure 1: *OF2i®-Raman measurement of 5 µm polystyrene (PS) beads. (a) Schematic of the OF2i®-Raman measuring cell: fluidic forces transport the particles through the cell; a focused laser beam optically manipulates the particles. See Reference 2. (b) A SCMOS camera records the scattered Raman signal of individual particles at up to 30 frames per second. The camera image shows the recorded light of three 5 µm polystyrene beads. See Reference 2. (c) The analysis of the camera signal (Raman spectra) is compared with a reference spectrum. See Reference 2. (d) The OF2i® signal uses the speed/scattered light of each particle to calculate particle size. See Reference 1.*

Technical highlights

- Automated measurement and cleaning, user-independent results
- Space-saving lab device
- Quick analysis with results in one PDF report
- Modular setup, ideal for retrofitting the Raman module

1. Šimić, M., Neuper, C., Hohenester, U., & Hill, C. (2023). Optofluidic force induction as a process analytical technology. Analytical and Bioanalytical Chemistry, 415(21), 5181-5191. DOI:10.1007/s00216-023-04796-3

2. Neuper C, Šimić M, Lockwood T, Gonzalez de Vega R, Hohenester U, Fitzek H, et al. Optofluidic Force Induction meets Raman Spectroscopy and Inductively Coupled Plasma – Mass Spectrometry: A new hyphen-ated technique for comprehensive and complementary characterisations of single particles. Analytical Chemistry. 2024; doi: https://pubs.acs.org/doi/epdf/10.1021/acs.analchem.3c04657

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