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Electrostatic Precipitator Model 5.561

Sampler for Nanoparticles

Highlights:

- ✓ Particle collection on a large variety of substrates
- ✓ Sampling of size-classified particles
- ✓ Can be attached to all GRIMM DMAs
- ✓ User-selectable voltage and electrode diameters
- ✓ Easy to handle

Applications:

- ✓ Investigation of particle morphology by TEM, SEM or AFM
- ✓ Composition of single particles or of bulk samples

The precipitator serves for the collection of nano- to micrometersized aerosols on different substrates by electrostatic precipitation. The samples can be used for off-line analyses like particle shape, morphology and composition. The samples are suitable for a variety of common analytical tools, e.g. transmission electron microscopes (TEM), scanning electron microscopes (SEM), or atomic force microscopes (AFM).

The precipitator can be used in two ways:

(1) Sampling of well defined size fractions by connecting the precipitator to the sample outlet of a differential mobility analyser (DMA). All GRIMM DMAs are designed for combination with the precipitator, and the sample flow through the precipitator can be provided by the GRIMM DMA control units.

(2) Sampling of unclassified particles by using the precipitator only. Depending on the charging state of the particles, a charger might be used to enhance sampling efficiency. Sample flow can be provided by a GRIMM unit or by any other pump.

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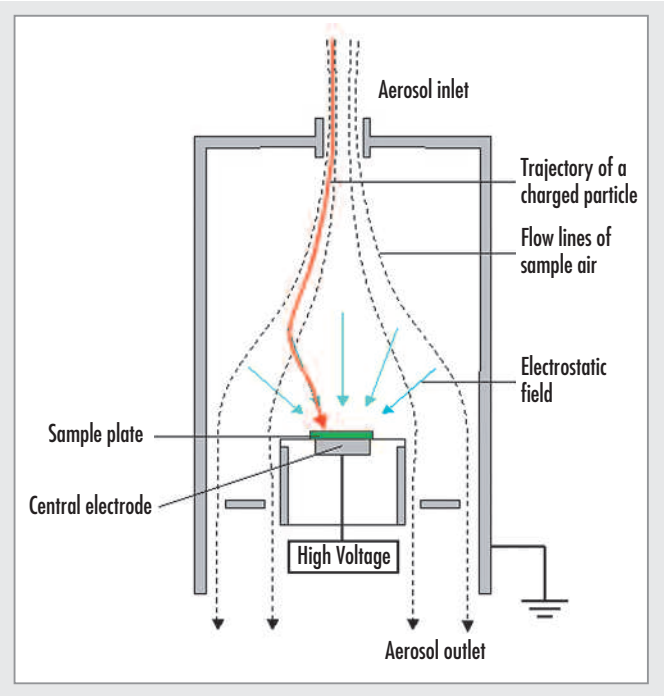
Principle / Advantages / Specifications

Principle

The sample flow is guided through a duct into the precipitator, where the flow expands to reduce air velocity. The reduced velocity increases the residence time of the particles near the central electrode thus the sampling efficiency. The insulated central electrode acts as sample holder, and the desired type of sampling substrate is placed on top of it.

A constant positive high voltage is applied to the central electrode and hence an electric field is set up between central electrode and the grounded walls of the precipitator. Thus, negatively charged particles are directed towards the central electrode and are collected on the substrate. Sampling efficiency and the deposition pattern on the substrate can be affected by varying sample flow rate, voltage, and diameter of the central electrode.



Advantages

The precipitator can be directly attached to GRIMM DMAs to achieve lowest diffusional losses. This feature is particularly important for the collection of smallest particles using a GRIMM S-DMA.

Magnetic electrode to hold nickel grids for TEM analysis without adhesive tapes.
Well defined symmetric air outlet to achieve uniform deposition patterns.

Specifications

Voltage	0 - 10000 V, user-selectable, positive, negative available on request
Sample flow	0.3 - 5 lpm (Pump not included)
Sample electrodes	Diameter 10 or 20 mm, magnetic
Sampling Substrates	Conducting or non-conducting
Status indication	Voltage display and LED
Size Range	0.8 - 1100 nm for GRIMM DMAs
Size	Diameter 126 mm, height 264 mm
Weight	3.3 Kg
Power Supply	100 - 240 VDC, 50 - 60 Hz or 12 - 18 VDC. 18 W.
Operation Conditions	10 - 40 °C, 0 - 95% RH (non-condensing)

Publications

J. Dixkens and H. Fissan (1999). Development of an Electrostatic Precipitator for Off-Line Particle Analysis. Aerosol Science and Technology 30:438-453

Dealer:

The European Leader in Particle Measurement Technology

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