

Particle Samplers

Category:
D. Particle Exposure Assessment

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Short technology description/Overview (*approx 300 words*):

The Model 3089 **Nanometer Aerosol Sampler (Electrostatic)** consists primarily of a grounded cylindrical sampling chamber with an electrode at the bottom of the chamber. A negative potential of up to 10,000 volts can be set on the electrode. A pump is used to draw aerosol into the chamber. In operation, a sample substrate (i.e., TEM grid) is fixed to the electrode with adhesive tape. The sampler is then run at a fixed flowrate and voltage. The electric field between the grounded chamber and the electrode focuses particles onto the substrate. The substrate can be removed after a period of time and the particles further analyzed.

The Dekati **Low Pressure Impactor (DLPI)** can be used to collect particles on 25 mm collection substrates (e.g. polycarbonate collection foil). The DLPI is a cascade low pressure impactor to classify airborne particles into 13 size fractions. The size classification is made from 30 nm up to 10 µm with evenly distributed impactor stages. The filters can be used for gravimetric, chemical and/or microscopic analysis.

In the Casella **thermophoretic precipitator**, particles are collected under influence of thermophoretical forces. As a particle moves in a temperature gradient in air, the air molecules on the hot side of the particle will move near the particle with a higher energy than the ones on the cold side. This results in a netto driving force towards the cold surface, thus depositing particles there (position grid). In practice the aerosol stream is lead near a metal wire, which is heated to 120°C by a current of 0,5 V. The substrate can be removed after a period of time and the particles further analyzed.

Main Features (Equipment Capabilities):

- Particle Size collected: 2-100 nm (NAS), 10, 6.8, 4.4, 2.5, 1.6, 1.0, 0.65, 0.40, 0.26, 0.17, 0.108, 0.06, 0.030 (DLPI), <0,01 to 10 µm (Thermoph.prec.)
- Collection medium: grid+filter (NAS), grid+filter (DLPI), grid (Thermoph. Prec.)

Typical Samples & Images:

Any further Information: