

New!


Mobility Separator - Electrometer

Real-time measurement of electrical mobility

Introduction

The Mobility Separator uses a sheath flow and a voltage to separate charged particles according to their electrical mobility.

Unlike the Differential Mobility Analyzer (DMA), where only particles with the selected mobility pass to the outlet (others being lost inside the instrument) the Mobility Separator passes two streams of particles to separate outlets, where they are available for measurement / characterisation.

In the Cambustion MSE, the high and low mobility streams are passed to two integrated aerosol electrometers, which measure the current caused by charged particles arriving via each outlet.

Automatic adjustment of the mobility setpoint to achieve equal currents on the two electrometers allows the Mobility Separator to instantaneously identify the mobility of the aerosol.

Applications

Tandem DMA Experiments

The use of a Mobility Separator can vastly shorten the time taken to perform traditional “tandem DMA” type measurements. By using the Mobility Separator downstream of the process which is changing the aerosol (e.g. humidity change when studying aerosol hygroscopicity) users can quickly establish the “new” mobility of the particles without the need for a lengthy scan.

This avoids the need for two scanning instruments in tandem, allowing greatly reduced experiment time (and enabling such measurements on less time-stable aerosols).

Measurement of Particle Morphology, Density & More

The Mass & Mobility Aerosol Spectrometer (M²AS) - see separate brochure - integrates the MSE with the Cambustion UDAC and CPMA to allow simple automated characterisation of aerosol mass, mobility diameter and mass-mobility exponent.

Traditional techniques for measuring these properties work well with spherical aerosols, but are less accurate and can be slow for agglomerate / highly fractal aerosols such as Carbon Black, graphitic carbon and other manufactured nanomaterials where complex properties such as surface area, effective density etc. are of great importance.



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