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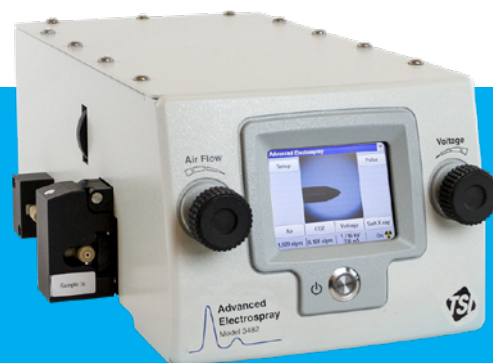
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ADVANCED ELECTROSPRAY AEROSOL GENERATOR MODEL 3482

PRODUCES PARTICLES AS SMALL AS
2 NM IN DIAMETER, IN
CONCENTRATIONS AS HIGH AS 10^7
PARTICLES/CM³



The Advanced Electro Spray Aerosol Generator (EAG) produces high concentrations of monodisperse, submicrometer particles from 2 to 150+ nm (initial droplet diameter of 150+ nm, nominal). The electro spray pushes a grounded liquid solution or suspension through a capillary tube into an electrical field. The electric field pulls the liquid from the capillary, creating a Taylor cone and forming individual droplets. Air and CO₂ mix with the droplets to evaporate the liquid content. During the drying process, the particles are neutralized using a soft X-ray neutralizer.

Features and Benefits

- + Aerosolization of particles from 2 to 150+ nm in diameter
- + Uniform size and shape of generated particles
- + Soft X-ray ionization
- + Multifunction touch-screen front panel including:
 - Live view of capillary tip and Taylor cone
 - On-screen control and readout of air and CO₂ flow, voltage, current, and neutralizer state
- + Ability to integrate with a variety of sample delivery systems including syringe pumps and autosamplers
- + Ethernet communication

Applications

- + Instrument calibration
- + Nano-aerosol studies
- + Macromolecular and submicrometer aerosol analysis
- + Nanometer-sized powder dispersion
- + Biomolecular studies
- + Nanoparticle production

SPECIFICATIONS

ADVANCED ELECTROSPRAY AEROSOL GENERATOR MODEL 3482

Method of Operation

A sample delivery method such as a syringe pump, autosampler, or liquid chromatography pump transports a liquid sample to the electrospray. The sample passes through a micro-cross where a platinum wire grounds the sample liquid and the sample is split into the capillary flow and the waste flow. The capillary extends into a chamber where a negatively charged orifice plate creates an electric field, inducing a charge at the capillary tip. The electric field acts on the induced charge to form ultrafine droplets that are mixed with clean air and CO₂. The droplets dry and are neutralized by the soft X-ray source within the chamber and the aerosol exits the instrument.

Particle Type

+ Aerosol particles as residue from electrosprayed solutions

Water-soluble, nonvolatile solids and liquids may be used to generate residue particles with diameters from less than 2 to about 50 nm. Using this approach, every spray droplet dries to a residue particle that contributes to the final aerosol, resulting in the highest aerosol concentrations obtainable from the Model 3482. The size distribution of the final aerosol depends on the concentration of the solute in the solution and the primary droplet size distribution, a property of the model 3482.

+ Aerosol particles from aqueous suspensions and emulsions

Aerosols of insoluble particles, lipid droplets, or macromolecules can be generated by spraying the corresponding dilute suspensions or emulsions. Proteins as small as 2 nm and PSL particles as large as ~150+ nm (somewhat larger than the spray droplets) have been aerosolized successfully in this way. Dilution ensures that most droplets contain no more than a single particle. The size distribution reflects that of the suspended particles or macromolecules; however, the concentration achieved is not as high as in the solution-residue method.

† Residue present below 20nm.

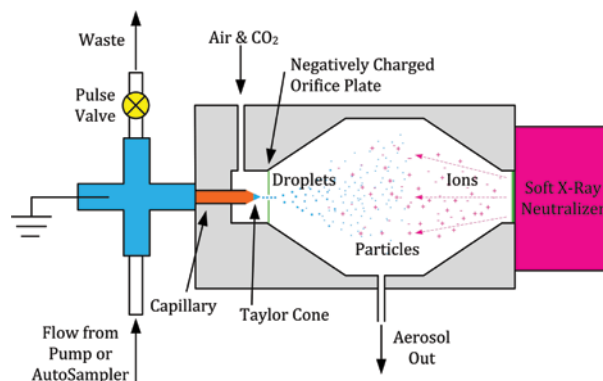
* Depends on material (solid, dissolved), particle size, liquid flow rate, liquid conductivity and particle loss

Specifications are subject to change without notice.

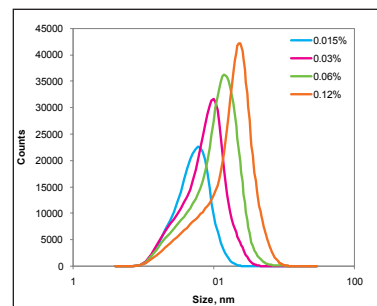
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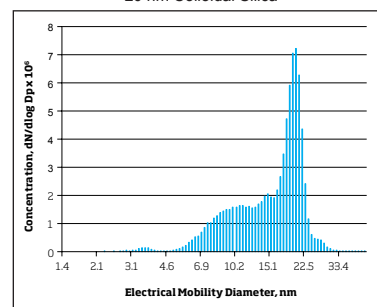
Operational Specifications	
Particle generation rate*	up to >10 ⁷ particles/cm ³
Liquid conductivity	typically 0.2 S/m
Liquid flow rate (using waste system)	2 to 10 µL/min
Capillary liquid flow rate	Approx. 50 to 100 nL/min
Particle size range	<2 to >150 nm
Initial droplet diameter	130 to 180 nm
Voltage range	-0.5 to -3.5 kV (-1 to -2 kV typical)
Current range	0 to 2000 nA (200 to 500 nA typical)
Physical Specifications	
Neutralizer	Soft X-ray
Power requirements	100 to 240 VAC, 50 to 60 Hz, 30W Typical Max
Dimensions	35.6 x 18 x 14 cm (14 x 7.1 x 5.5 in.)
Weight	3.6 kg (8 lb)
Optional Accessories	
Syringe Pump	P/N 3482-spump
Kit includes capillaries and tubings	P/N 3482050
1 ml syringe with connector	P/N 3482-spump-acc



Sucrose Residue Particles From Solution



20 nm Colloidal Silica†



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