Enviro
Technology Services Ltd
part of CuraTerrae

CCN

Cloud Condensation Nuclei Counter (Single and Dual-Column)

Outcome

The Cloud Condensation Nuclei Spectrometer advances our understanding of cloud condensation nuclei (CCN) aerosol particles that can form into cloud droplets. Without CCN no clouds would form, and with no clouds there would be no sources of water, the absence of clouds would also prevent cooling which offsets global warming and the greenhouse effect. The understanding of the properties of CCN, in space and time, is for simulating how clouds form and evolve in weather and climate models. The more than 200 CCN100/200s that are currently in operation worldwide attests to the importance of improving our understanding of environmental aerosols as cloud forming particles so that as climate change continues to grow as a threat to humanity, as scientists we are not passive observers but active warriors in the fight to mitigate climate change's impact.

Overview

Laboratories measurements with Droplet's CCN100/200 are being made in laboratories and cloud chambers to document how aerosols of different sizes and composition form cloud droplets. Other measurements in urban environments identify which pollutants can impact cloud and precipitation formation. The CCN is an essential tool for weather modification programs that use it to determine when and where to seed clouds.

The CCN comes equipped with a single (CCN-100) or dual (CCN-200) columns. The measurement ranges of the CCN-100 and the CCN-200 are identical. The CCN-100 has a single-column and will make measurements one supersaturation at a time. The CCN-200 has two columns and can be operated at two supersaturations simultaneously. If a researcher is doing ambient or laboratory measurements where aerosols are being modified in some way, and a split-sample experiment, comparing the response of the aerosols, the CCN-200 is ideal. Both versions can be operated on the ground or on aircraft.

Applications

- Atmospheric research
- Pollution research
- Cloud processing of aerosols
- CCN activity of black carbon
- CCN activity of primary biological aerosol particles (PBAP)
- Impact of aging on activity of CCN particles
- Optical and chemical properties of CCN
- Bioactivity of CCN

Advantages

The CCN is a trusted laboratory staple, with over 300 instruments currently in use around the world.

The CCN measures the spectrum of cloud condensation nuclei (CCN) concentration as a function of supersaturation continuously using uninterrupted flow and a multi-channel,optical particle counter that measures the size of the activated droplets. The CCN features supersaturation as low as 0.07% and as high as 2%.

To any scientist who studies climate change, clouds, or is involved in weather modification the CCN is the only instrument of its kind that allows them to study cloud formation processes in a ground or airborne lab setting.

Product Specifications

Measured Parameters:

•Single-particle light scattering (for activated nuclei)
• Temperature
• Pressure

Derived Parameters:

•Number concentration range (Depends on supersaturation:
•6,000 particles/sec\ at ss below 0.2%
•20,000 particles/sec at ss above 0.3%
•Aerosol medium: Air, 5-40°C
•Number of particle size bins: 20
•Particle size range (from OPC, after supersaturation): 0.75-10µm
•Sampling frequency: 1Hz/1sec
•Supersaturation range: 0.07-2.0%
•Time required for supersaturation change: 30 seconds for 0.2% change
•Maximum number of automatically scanned supersaturation settings: 250
•Flow range: Total flow: 200-1000 volume cc/min (factory calibrated at 500 Vccm), Sample flow: 20-100 Vccm, Sheath flow: 180-900 Vccm

Environmental Operating Conditions:

•Temperature: 5°-40°C
•Relative humidity: 0-100% non-condensing
•IP50 rated

Data System and Power Requirements:

•Data system: On-board Celeron 1GZ processor, 512 MB RAM, 80GB hard drive, UI with keyboard and monitor
•Software: Particle Analysis Data Software (PADS), CCN Counter Software, and Playback Software included
•Data system interface: RS-232, 9.6 Kb/sec Baud Rate (CCN-100), or 57.6 Kb/sec (CCN-200)
•Power requirements: 28VDC

Weight:

•CCN-100: With frame: 3.52 kg
•CCN-100: Without frame: 29.0kg
•CCN-200: With frame: 50kg
•CCN-200: Without frame: 43.8

Available Accessories

•CCN-100/200 Consumables Kit
•CCN-100/200 Basic Field Repair Kit
•Aircraft Rack
•Aircraft Inlet
•Science Care Program
•1 and 2 Year Extended Warranty
•Lifecycle Care Program

The Droplet Guarantee

Droplet understands how the versatility and performance of an instrument can impact your research, career, and the world we live in. As you strive to provide a better understanding of our planet, we guarantee to be here to support you through your journey.

Whether you are establishing your first laboratory or are a tenured researcher; we have a team of scientists, engineers, and technical staff available to assist with application questions, technical support, data analysis, and training.

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