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Get more signal with the *Aridus 3* Desolvating Nebulizer System

The Teledyne CETAC *Aridus 3* desolvating nebulizer system is a specialized liquid sample introduction accessory for inductively coupled plasma mass spectrometry (ICP-MS). The *Aridus 3* can enhance analyte sensitivity up to 10 times or more and can greatly reduce solvent-based interferences such as oxides and hydrides.

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Aridus 3 Desolvating Nebulizer System

Introduction

The *Aridus3* couples a low-flow (50, 100, or 200 µL/min) PFA nebulizer and a heated PFA spray chamber with an inert fluoropolymer membrane. This combination provides enhanced analyte sensitivity while reducing solvent based interferences such as oxides and hydrides. The *Aridus3* is particularly advantageous for small volume and highly corrosive samples such as those generated in the earth sciences and the semiconductor industry.

The *Aridus3* can be easily interfaced with all current types of ICP-MS instruments, including quadrupole (Q), high resolution (HR), multicollector (MC), and time of flight (TOF) systems.

The sample path (nebulizer, spray chamber, and membrane) are all made of fluoropolymers which are resistant to all acids including hydrofluoric acid (HF). Sample-solvent vapors pass through the inert membrane to vent, providing very low oxides (% CeO/Ce is typically 0.05% or less, depending on ICP-MS model and operating conditions).

Benefits

- Analyte sensitivity enhanced up to 10 times or more, depending on liquid sample uptake rate
- Low-volume sample uptake rates of 50, 100, or 200 µL/min, preserving valuable sample
- C-Flow PFA nebulizer with integrated autosampler probe for use with Teledyne CETAC ASX-112FR MicroAutosampler
- Heated PFA spray chamber for higher sample transport efficiency
- Both PFA nebulizer and PFA spray chamber are behind a secured door to alleviate electrostatic effects
- Inert fluoropolymer membrane for resistance to acids (including HF) and low oxide and hydride levels
- Built-in mass flow controllers (MFCs) for precise setting of Ar sweep gas and N_2 addition gas
- Convenient computer software control of spray chamber temperature, membrane oven temperature and both Ar sweep gas and N_2 addition gas allows remote tuning if the Aridus3 is placed in a clean enclosure
- New Flow Saver software application allows the user to turn off Ar and N_2 gas flows after completion of an overnight run, saving valuable gases
- New removable membrane heater block for ease of cleaning or replacement

Removable Membrane Desolvator Module

Aridus3 Removable Membrane Desolvator Module

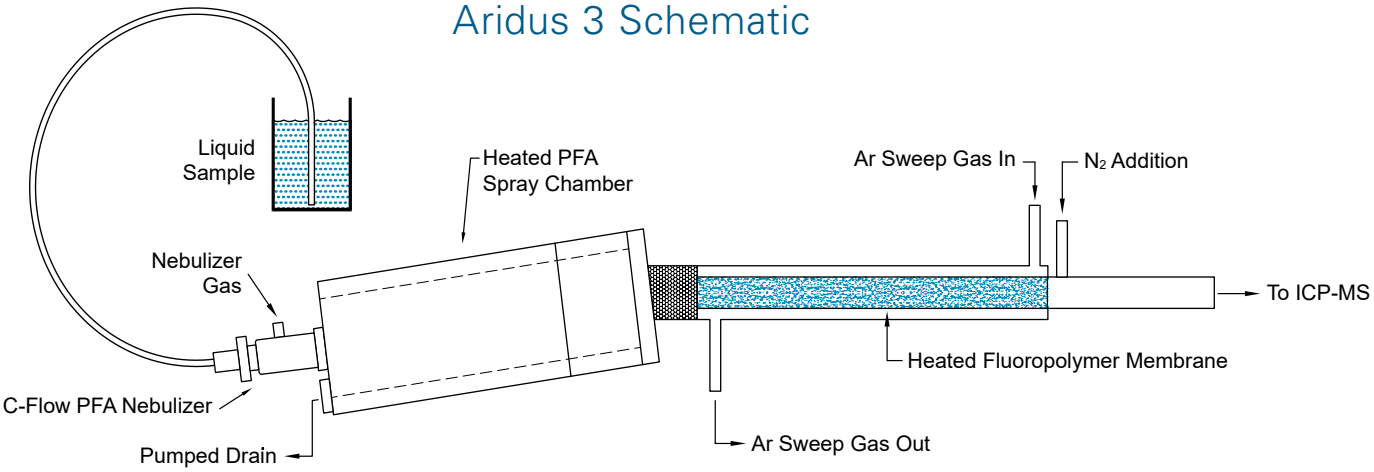
The *Aridus3* is equipped with a removable membrane desolvator module (depicted at left). The module is an integral part of the *Aridus3* chassis and simply pulls directly out of the back panel (no need to open the main cover). Once removed from the Aridus3, the membrane desolvator module can be conveniently cleaned or replaced. A dedicated rinse kit is provided to introduce an appropriate cleaning solution such as dilute nitric acid.

Principle Of Operation

Sample solution is introduced to the *Aridus3* by a self-aspirating C-Flow PFA nebulizer. The nebulizer aerosol is sprayed into a heated (up to 110°C) PFA spray chamber to maintain the sample in a vapor phase. The sample vapor then enters a heated fluoropolymer membrane desolvator (140°C) module.

A counter-current flow of argon sweep gas is added to remove solvent vapors that permeate the porous wall of the membrane. Non-volatile sample components do not pass through the membrane wall and continue to the ICP-MS instrument.

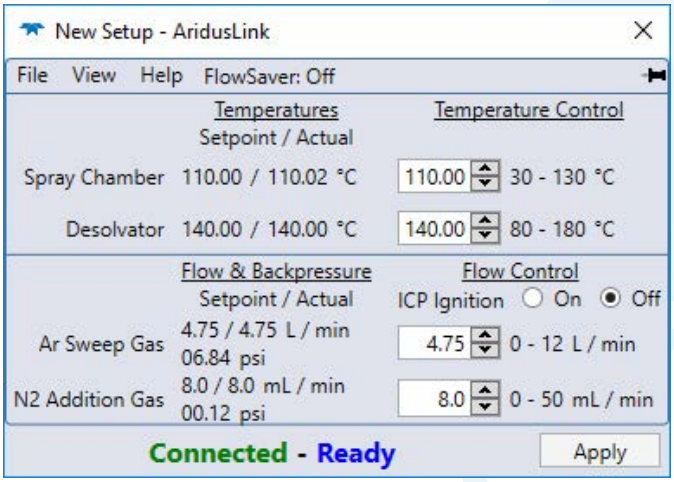
Aridus 3 Schematic



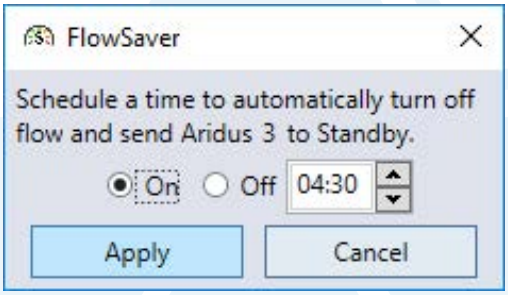
Software Control of Gas Flows and Temperatures

The *Aridus3* is equipped with dedicated mass flow controllers (MFCs) for precise control of both the Ar sweep gas and N_2 addition gas flows. Control is also provided for the PFA spray chamber and membrane oven temperatures. An easy to use software interface (which can be loaded onto the host ICP-MS computer or a separate computer such as a laptop) allows ease of parameter tuning and minimizes any manual user interaction with the *Aridus3*. The latter feature is an important benefit if the *Aridus3* must be placed in a special enclosure such as a clean box.

In addition to temperature and gas flow control, the *Aridus3* software has a new Flow Saver timing function that allows the user to turn off the Ar sweep gas and N_2 addition gas flows at a predetermined time. This benefit saves valuable gases after a longer unattended sample run.



Aridus3 Software Control Screen



Flow Saver Setup Screen

Option: ASX-112FR Micro Autosampler

The ASX-112FR (Flowing Rinse) MicroAutosampler is designed for use with the Aridus3. The ASX-112FR offers the benefits of a transparent protective cover and a dual flowing rinse station to ensure sample integrity from the first to the last sample in a sequence. All sample vials, racks, and trays are constructed of metal-free, acid-resistant polymer materials. A hinged door in the front of the cover allows easy access to sample and standards.

There are five standard positions for 20-mL PFA vials and nine standard positions for 4-mL PFA vials. Sample racks include 24, 48, and 96 position types for 0.5 mL to 2.0 mL sample volumes. Bel-Art half racks (30 and 42 position) for 7-mL and 14-mL samples are also available.

The modular design of the ASX-112FR allows placement on the Aridus3 cover for maximum conservation of valuable benchtop space. This arrangement also minimizes sample path length using the C-Flow PFA nebulizer with integrated sample probe. Computer interfaces include RS-232, USB and optional IEEE-488.

Technical Specifications

Nebulizer

C-Flow PFA; 50, 100, or 200 µL/min

Spray chamber

PFA with pumped drain
Temperature 110°C

Desolvating membrane

Fluoropolymer

Ar Sweep Gas	0.00 to 12.00 L/min
N_2 Addition Gas	0.0 to 50.0 mL/min
Input Pressure, Ar	70 to 100 psi (4.8 to 6.9 bar)
Input Pressure, N_2	50 to 100 psi (3.4 to 6.9 bar)
Temperature	140°C

Voltage

120 VAC +/- 10%, 50/60 Hz, 6A
220 VAC +/- 10%, 50/60 Hz, 3A

Minimum computer requirements

Windows 7 / Windows 10 (32 bit or 64 bit)
.Net 4.6 (included on CD or Windows 10)
Minimum 2GB RAM
One available serial or USB port

Dimensions*

Height	19.2 cm
Width	33.7 cm
Depth	52.0 cm

*allow extra space for cables/tubing

Weight

11.8 kg

Optional

ASX-112FR MicroAutosampler

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