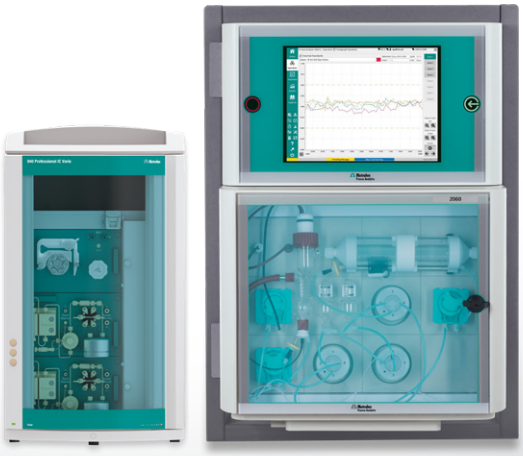


2060 MARGA

Continuous measurement of aerosols and gases in ambient air

PUSHING THE LIMITS TOGETHER

Metrohm Process Analytics

Ambient air quality –

Critical for our health and the environment

According to the World Health Organization, 92% of the world population lives in places where the WHO air quality guidelines levels are not met. Ambient air (outdoor air pollution) in both cities and rural areas was estimated to cause 4.2 million premature deaths worldwide in 2016.

When considering the effects of aerosols on health and the environment, it is necessary to understand how they are formed from their precursor gases and how their concentration and composition vary with diurnal and seasonal cycles.

Continuous measurements of aerosols are required with sufficient time resolution so that the various aerosol formation processes can be clarified.

SIMULTANEOUSLY QUANTIFY AEROSOLS AND GASES AROUND THE CLOCK

The **2060 MARGA** from Metrohm Process Analytics measures gases and aerosols from the same air mass. These are separated from each other by selectively dissolving them in water. The resulting solutions are then analyzed via ion chromatography with conductivity detection. Separating gases from aerosols allows the detection of important precursor gases and the subsequent inorganic ionic species found in the aerosols.

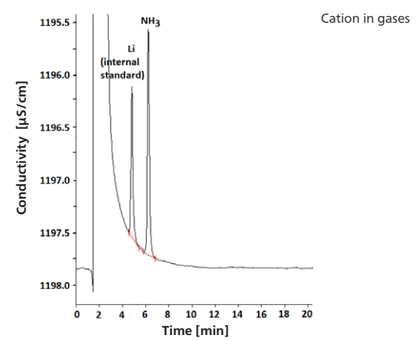
Gases

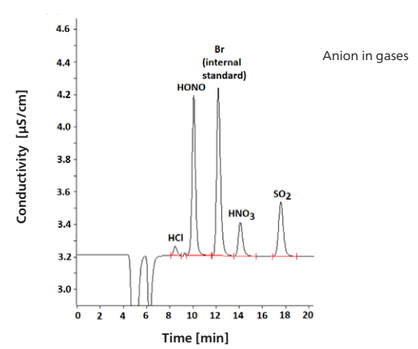
- HCl
- HNO_3
- HONO
- SO_2
- NH_3
- HF *
- NH_3

Aerosols

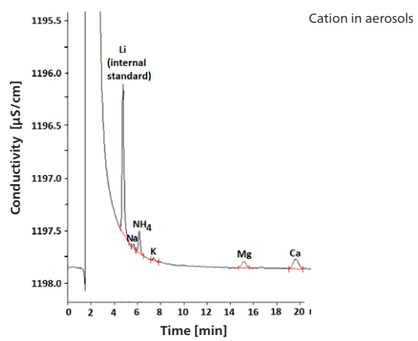
- Cl-
- NO_3^-
- SO_4^{2-}
- NH_4^+
- Na^+
- Ca^{2+}
- Mg^{2+}
- K^+
- F^{-*}

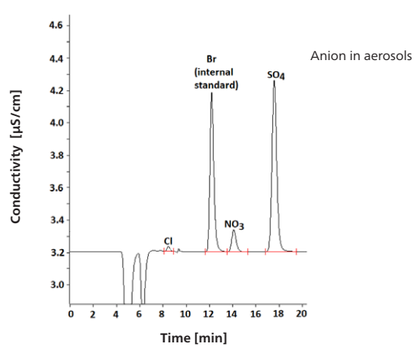
*Optional with 2060 MARGA analyzers





Anion and cation chromatograms in gas fractions

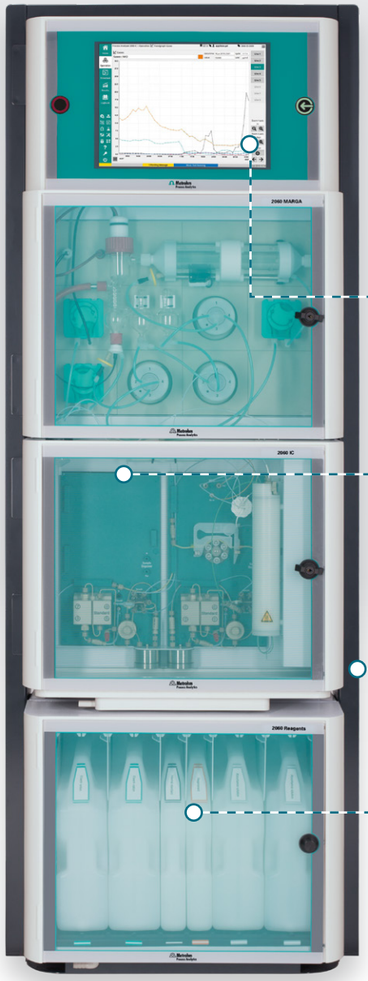




Anion and cation chromatograms in aerosol fractions

2060 MARGA –

Monitor for AeRosols and Gases in ambient Air



Based on the 2060 online analysis platform from Metrohm Process Analytics, the 2060 MARGA can operate for **up to 1 month unattended** at a remote site. Results are stored in an onboard database, with various options for the transmission of «live» data to a central data platform.

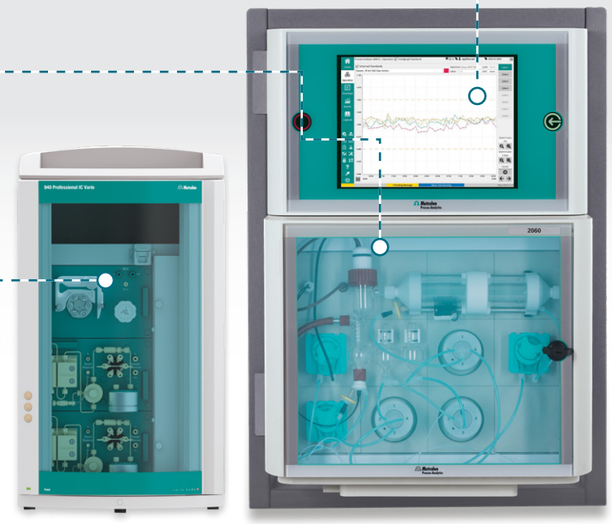
KEY FEATURES:

1. Built-in Metrohm ion analysis excellence with latest MagIC Net software
2. All versions supplied with standard validated application for ambient air monitoring
3. All new hardware, optimized for reliable operation and easy maintenance
4. Safe, rugged enclosure designed to IP54 specifications for easy maintenance and daily checks without the need to manipulate the electronic part

No calibration needed –
Automatic validation using internal standard

ETV
www.epa.gov/etv

5. Analysis method can be adapted to determine fluoride, MSA, oxalate, amines, or organic acids
6. Option for sample rates of 0.5 or 1.0 m^3/hr, with self-cleaning critical orifice to regulate flow
7. Detection limits without pre-concentration of 0.01 µg/m^3 achievable



2060 MARGA M (MONITORING)

The 2060 MARGA M is ideal for routine monitoring at a permanent site. Everything is packed into a single instrument, with separate subcabinets for the sample collection wet part, ion analysis cabinet for anion and cation determinations, plus reagent containers with level sensors.

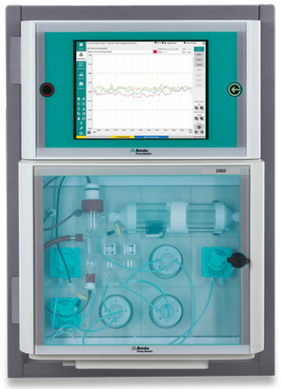
The 2060 user interface displays trend graphs, program progress, and clear messages when user intervention is required. All data relevant to the measurements can be consulted on the touch screen or remotely with a suitable application.

2060 MARGA R (RESEARCH)

A flexible version, ideal for research applications, features the 2060 user interface and sample collection wet part.

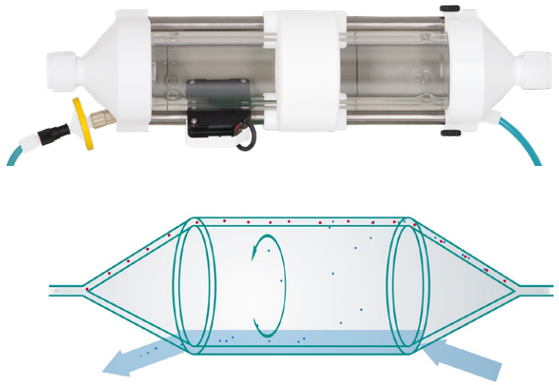
Sample analysis is carried out on a stand-alone Metrohm 940 Professional IC Vario TWO/SeS/PP, including sequential suppression for the anion analysis channel. Installed on-site for a limited time campaign, the 2060 MARGA R works unattended in the same way as the 2060 MARGA M. When not required for field use, the 940 ion chromatograph can be put to work in the laboratory, using an external PC and MagIC Net, to run any of the multitude of applications available from Metrohm.

Gas and aerosol sampling from the same air mass



WET ROTATING DENUDER (WRD)

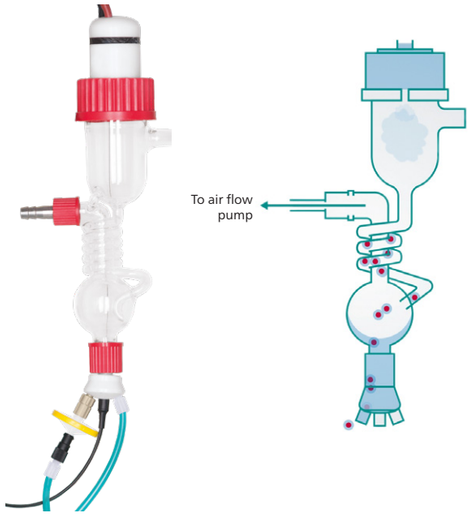
The WRD consists of two concentric glass tubes, forming an annulus which is constantly fed with dilute aqueous H_2O_2 solution. As these tubes rotate, a continuous liquid film forms on the inside of the outer cylinder and the outside of the inner cylinder. Ambient air is drawn in and, due to high diffusion coefficients, close to 100% of acid gases and ammonia are stripped from the air mass. The resulting solution of gases is continuously sampled. Due to velocity of the air within the WRD and also the design creating laminar flow, aerosols and particulates pass through to the Steam-Jet Aerosol Collector (SJAC).



Wet Rotating Denuder (WRD) of the 2060 MARGA.

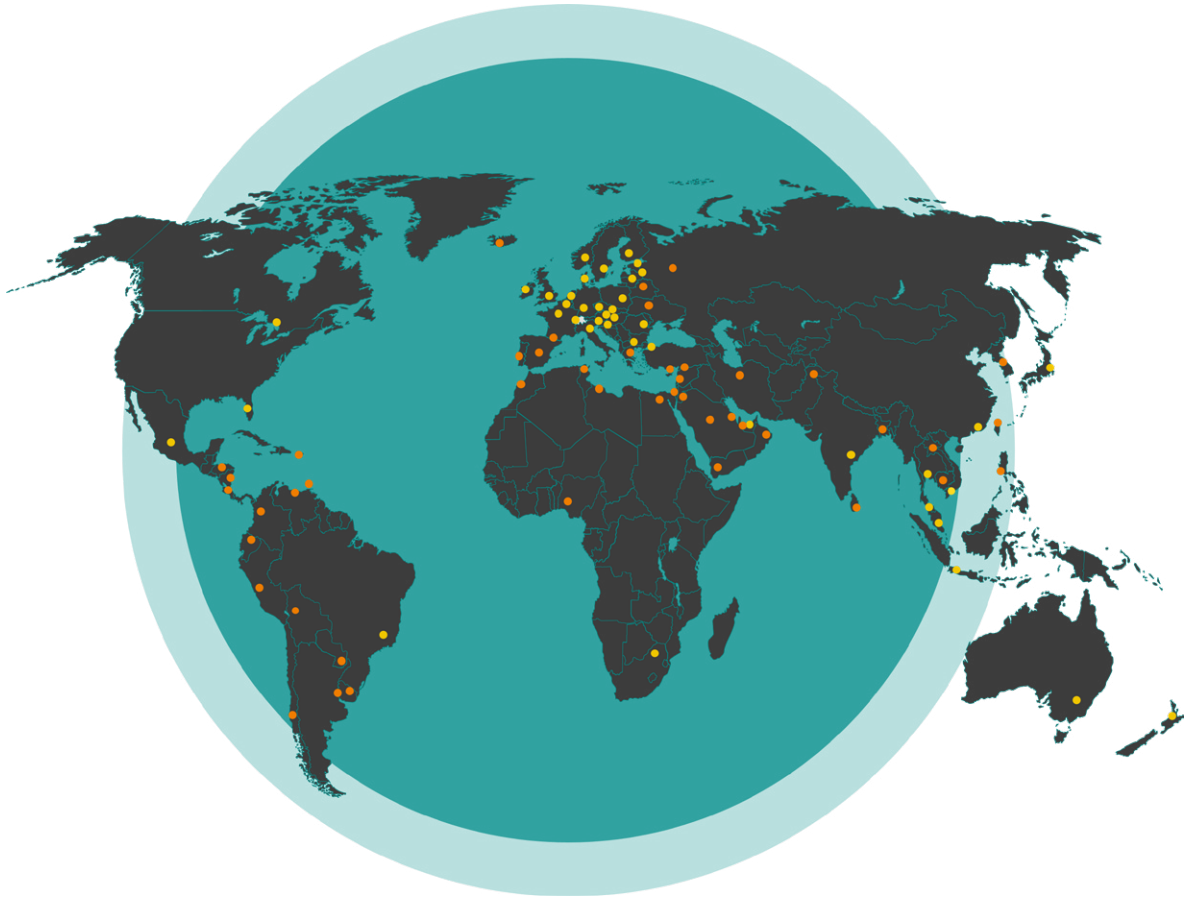
STEAM-JET AEROSOL COLLECTOR (SJAC)

After the WRD, the ambient air, stripped of its gaseous water soluble components, enters the SJAC. Supersaturated steam is introduced, causing the aerosols to grow into larger, heavier droplets. Further on the air passes through a cyclone, collecting the particles in water by inertial separation. The resulting solution of dissolved inorganic ionic aerosol species is continuously sampled at the bottom of the SJAC for analysis by ion chromatography along with the sample from the WRD.



Steam-Jet Aerosol Collector (SJAC) of the 2060 MARGA.

We are here for you worldwide



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Subject to change without prior notice. Printed in Switzerland by Metrohm AG, CH-9100 Herisau.
Layout by Andrea Ferreira, Metrohm Applikon B.V.
8.000.5349EN – 2021-01