

US-EPA monitors quality of ambient air with MARGA

The US-EPA has signed a long-term contract for the supply of up to 40 MARGA systems for their CASTNET measurement network across the USA. There are an additional 9 MARGA systems located in Scotland(2), South Korea(5), The Netherlands(1) and China(1).

MARGA (Monitor for AeRosols and Gases in ambient Air) is an ambient air monitoring system that is capable of measuring the gas phase concentrations of NH_3 , HNO_3 , HCl , HNO_2 , and SO_2 , as well as the particulate matter (aerosol) concentrations of NO_3^- , Cl^- , SO_4^{2-} , NH_4^+ , Na^+ , K^+ , Ca^{2+} and Mg^{2+} . This unique instrument, developed by Applikon Analytical in cooperation with the Dutch Energy Research Institute (ECN), draws in a 1 m^3 volume of air each hour. The gases are then quantitatively (more than 99.7%) absorbed in a wetted rotating denuder (WRD) and the aerosols, which pass through the WRD, are trapped in the steam-jet aerosol collector (SJAC).

The trapped aerosols are quantitatively (more than 99.7%) separated from the airstream cyclone using condensational growth with supersaturated steam. The liquid streams from the WRD (dissolved gases) and SJAC (dissolved aerosols) are degassed and mixed with an internal standard before controlled injection into an anion and a cation ion chromatograph, both from Metrohm.

The determinations are continuously controlled by an internal calibration, performed by the addition of a standard solution (Li & Br). The instrument can operate for 7 days unattended and can be controlled via an internet connection. The size of particulate matter (PM) can be selected by placing special designed cyclones (e.g. PM_{10} , $\text{PM}_{2.5}$ or $\text{PM}_{1.0}$) before the entrance of the sampling system.

