

MOBILE MASS SPECTROMETER FOR ON-SITE GAS ANALYTICS

Problem – Challenge

Gaseous species play an important role in chemical, physical and biological processes. Observing concentrations of gases helps to unravel the relevant dynamics. Usually, analytics of environmental gases focus on a small set of substances and need expensive, highly specialized instrumentation and techniques for their sampling, analyses and quantification. Until recently, such demanding work would require a well-equipped lab and was not suited for field studies.

Solution

To be able to measure gases on-site and even in remote places, Eawag developed a portable mass spectrometer which is now commercialized through its spin-off Gasometrix GmbH. So called “mini-Ruedi” is able to quantify nitrogen, oxygen, carbon dioxide and methane as well as trace gases like helium, argon and krypton, with a remarkable precision of one to three per cent analytical uncertainty. mini-Ruedi operates autonomously and in real time, even on long term operation, taking very small samples so as not to interfere with the natural dynamics of the environment and analyzing the various gases in less than a minute.

This 13 kg rugged device is already widely used, for applications in Eawag research projects around the world, as for example, for water analyses to assess groundwater systems or to investigate anthropogenic effects on waterbodies. In a project in the Czech Republic, soil samples were analysed to study gas exhalations from springs. A Norwegian oil and gas company monitored gas flows, in order to detect methane or carbon dioxide leaks. Dr. Matthias Brennwald, CEO of Gasometrix, sums it up in short: “Analyses which in the past would have been inconceivable – partly for financial reasons, as they’d have involved months of laboratory work – are now suddenly possible.”



Photos & Text: Eawag