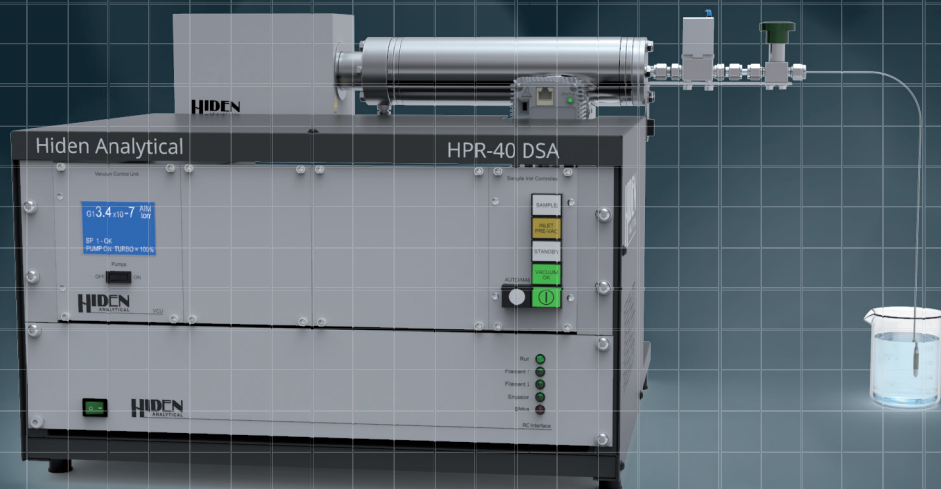


# Membrane Inlet Mass Spectrometry (MIMS)

## SOLUTIONS FOR DISSOLVED GAS ANALYSIS IN SWIMMING POOLS



HPR-40 DSA Membrane Inlet Mass Spectrometer - MIMS

### Reference

The Membrane Introduction Mass Spectrometry (MIMS) technique provides a solution to these problems by specific and sensitive *in-situ* measurement of DBPs, as referenced by the recent publication:

*"Analysis of chlorination by-products in swimming pool water by Membrane Introduction Mass Spectrometry – Influence of water physicochemical parameters"*

This study investigates the effect of analytical conditions on DBPs quantification and assesses the relevance of using MIMS for reliable analysis under typical swimming pool operating conditions.

<sup>1</sup>Lucie Tsamba (CSTB), Olivier Correc, Pierre Le Cloirec and Nicolas Cimetière (2019) *Rapid Communications in Mass Spectrometry* DOI: 10.1002/rcm.8399.

Swimming pools include reactive compounds, including the disinfectants, cleaning compounds and several compounds released by bathers to form disinfection by-products (DBPs). Medical studies, including incidence and distribution of infectious diseases have shown adverse effects on health associated with the exposure to DBPs present in indoor swimming pool atmosphere.

### Key Features

- ▶ HPR-40 DSA MIMS system is offered with a broad range of inlets, including flow through inlets with integrated thermocouple for *in-situ* temperature measurement, dual probe inlets for simultaneous analysis in liquid and headspace, and enzyme kinetics probes.
- ▶ It allows for *in-situ* mass resolved determination of dissolved species with real time data acquisition and display.
- ▶ Mass range is 200 amu as standard, with 300 or 500 amu mass ranges offered as options.
- ▶ Software applications provide for user control of the mass spectrometer, inlet system control, data acquisition from the mass spectrometer and external devices, temperature and pH probes for example.



## Example data

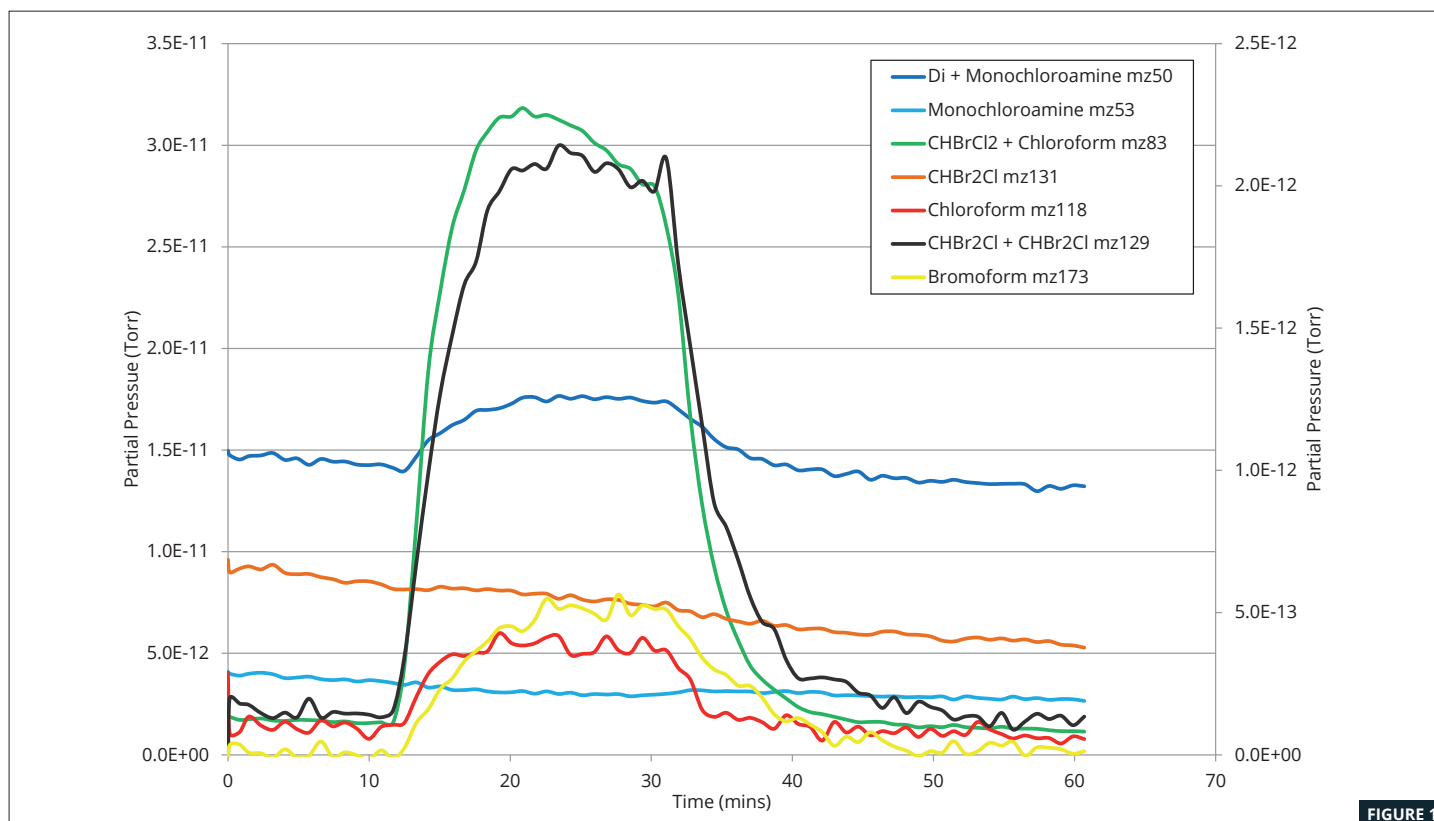


FIGURE 1

▶ Figure 1. Trend analysis showing MS data including chloroform, bromodichloromethane, dibromochloromethane, and bromoform.



FIGURE 2

The HPR-40 DSA mass spectrometer system detects low concentrations of disinfection byproducts, DBPs, such as THMs (trihalomethanes) and chloramines, in swimming pool water and can be used for both qualitative and quantitative analysis.

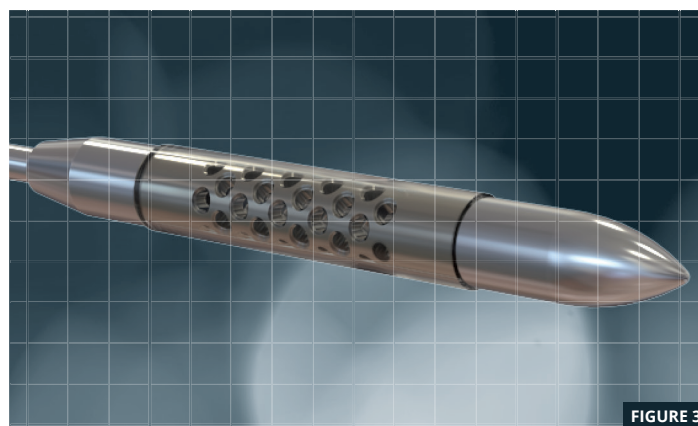


FIGURE 3

▶ Figure 2. Dual probe sampling system for head space and liquid sampling.

▶ Figure 3. Dissolved species probe.