

## Real time in situ dissolved gases monitoring in groundwater by CF-MIMS for hydrogeology

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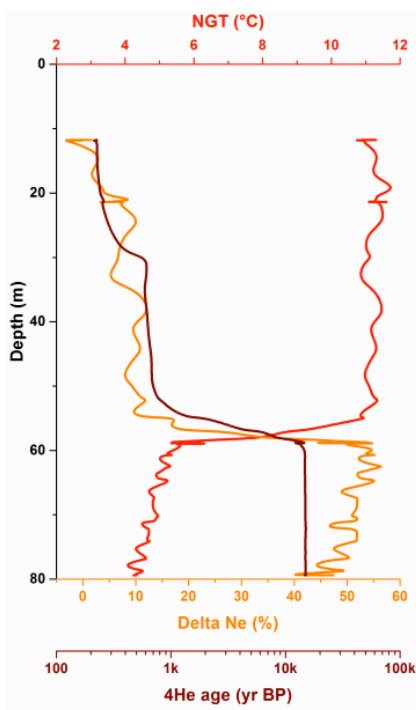
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We present an optimized Continuous Flow - Membrane Inlet Mass Spectrometer (CF-MIMS) for in situ real time monitoring of dissolved gases in groundwater. Our system allows continuous measurements of noble gases (He, Ne, Ar, Kr and Xe) and CO<sub>2</sub>, O<sub>2</sub>, N<sub>2</sub>, N<sub>2</sub>O, H<sub>2</sub>, CH<sub>4</sub> in water. A large membrane introduction system and an adapted ionisation procedure allow our system to measure all gases every 15s or one gas every 1.5 s. We present here the results of dissolved gases tracer tests in a fractured aquifer as well as an in situ real time well-logging of dissolved gases. The high resolution breakthrough curve of the dissolved gas tracer improve our knowledge on transport characteristics in fractured aquifers. High resolution profiles of dissolved gases in boreholes—inform us about stratification of water masses, redox and recharge conditions (NGT, Excess air) and allow <sup>4</sup>He age estimation (figure below).



This breakthrough in the measurement of dissolved gases (in situ monitoring and high frequency) is very promising for physical, chemical and biogeochemical studies in waters.