

# LiquiFace



## High performance aqueous compound isotope analysis

The LiquiFace is designed to couple any standard high pressure liquid chromatograph (HPLC) or pumping system to the **isoprime precisION** IRMS for the determination of  $\delta^{13}\text{C}$  values in organic compounds. Aqueous solutions, separated by the HPLC unit, are converted to gaseous phases in the LiquiFace and transferred to the IRMS. The LiquiFace can analyze a range of sample types including: carbohydrates, alcohols, organic acids, amino acids and peptides.

### HPLC or Direct Injection

The LiquiFace can be connected to a HPLC unit and receive a sample liquid stream for conversion to  $\text{CO}_2$ . Alternatively the internal pump on the LiquiFace can be used to carry out direct injection of samples. Peristaltic pumps in the LiquiFace are used to deliver reagents to the reaction site and not the HPLC pump maximizing the users operational flexibility and choices. Direct injection to the LiquiFace means that users can perform both bulk isotopic analysis and compound-specific analysis using the same system.

### No Sample Derivatisation

LC-IRMS of non-polar compounds do not need to undergo complex derivatisations as with the same sample run via GC-IRMS. The removal of any need for derivatisation on these compounds means that back calculations do not need to be performed on the eventual  $\delta^{13}\text{C}$  results. In many cases samples need only be diluted with pure water, filtered and then analyzed via LC-IRMS using the LiquiFace.

### Low Temperature Sample Conversion

Conversion of the aqueous eluent to sample gas is performed in a low temperature reactor at up to  $100^\circ\text{C}$ . Low temperature conversion of the eluent allows our interface to analyze thermolabile samples which will disintegrate at elevated temperatures. The mixture of eluent and sample gasses, generated in the LiquiFace heater are cooled to room temperature and then separated in a gas exchanger with the remaining eluent going to a waste line and the sample gas passing through a Nafion dryer into the **isoprime precisION** IRMS.



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## Exceptional Tolerance to Excess Oxygen

When the LiquiFace is coupled to the **isoprime precisION** Isotope Ratio Mass Spectrometer, the result is an exceptional system with an unparalleled tolerance for excess oxygen load. With the use of sodium persulfate as oxidation agent, a large oxygen excess can enter the IRMS and damage the ionisation filament. The unique thorium coating of the **isoprime precisION** ionisation filament results in lifetimes of years rather than months. This resistance to oxygen means that an on-line reduction furnace to remove the excess is not required, reducing consumables and possible peak broadening.

## Reliable Peak Chromatography

The LiquiFace has been completely designed with chromatography in mind. Once your sample is separated by the LC column, then there is minimal detrimental effect of the interface on the chromatography.

Therefore, for particularly complex separations, the LiquiFace can be depended upon to provide the very best in chromatography performance.


## Unbeatable Performance

Isotopic precision, accuracy and linearity performance is exceptional with the LiquiFace system due to the highly efficient oxidation reaction resulting in full quantitative conversion of the organic carbon to CO<sub>2</sub>. This level of performance means that the LiquiFace is able to cover a suite of sample types with a complete independence up on sample concentration making the analysts life even simpler.

## Efficient water removal

The technique of LC-IRMS is prone to high water backgrounds which can cause damaging interference with the CO<sub>2</sub> sample gas in the ion source. To counter these problems, the LiquiFace has a dual stage water removal from the sample gas stream, so that you can have complete confidence in your results.

## High-precision, high-throughput LC-IRMS interface

<b>Analysis method:</b>	Combustion at up to 100°C of the LC eluent into gaseous products separated from the aqueous eluent using a gas exchanger and passed into the <b>isoprime precisION</b> IRMS for stable isotope analysis	
<b>Analysis mode:</b>	δ <sup>13</sup> C of organic compounds	
<b>IRMS Specifications</b>	Direct Injection	LC Injection
<b>External precision:</b>	δ <sup>13</sup> C ≤ 0.30 ‰	δ <sup>13</sup> C ≤ 0.30 ‰
<b>Preferred LC system:</b>	Agilent 1260 Infinity LC system equipped with a 1260 Degasser, Pump, Autosampler and Thermostatted Column Compartment (TCC). Pump type and LC Column utilised on the instrument is optional and will be dependent upon specific application.	 <b>Agilent Technologies</b> Channel Partner
<b>Software:</b>	Proprietary lyticOS® software suite, including Apex track and ratio calculation options as well as appropriate LC system software (Chemstation is the proprietary software on the Agilent 1260 Infinity LC)	