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Quality control measurements to show precision and accuracy of the Delta Ray Connect by year long measurements of d18O on water reference material

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It is known that traditional methods, such as isotope ratio mass spectroscopy, show high accuracy and precision when measuring d18O of water, but in addition to traditional methods, isotope ratio infrared spectroscopy is a new option for performing laboratory analysis.
Thermo Scientific™ Delta Ray™ Isotope Ratio Infrared Spectrometer (IRIS) with the Universal Reference Interface (URI) Connect is a laser-based instrument which is operating in mid-infrared range at 4.3 μm. It allows continuous measurements of isotope ratios and concentration of CO_2 as well as discrete sample measurements, such as head space analysis or direct sample transfer from gas bags or injection by syringe.
Here we present automated measurements of d18O with equilibration method. In the sample preparation step, 0.8 mL of standards were added into vials, after which the headspace was flushed with 1% CO_2 by autosampler-assisted flushing procedure. Samples were placed on a shaker and equilibrated at room temperature, overnight.
Measurements were done in a time period of one year. For referencing, several certified international standards were used, while USGS 48 was treated as quality control sample. The Principle of Identical Treatment was applied for sample and standard preparation, in measurement procedure, as well as in the evaluation of the results. Two-point calibration was used.
The results are confirming high precision and accuracy of the method over one year. This shows that Delta Ray Connect can be used for determination of d18O of water samples. Furthermore, the preliminary results of tap water and wine measurements with the Delta Ray Connect allow us to further extend the Delta Ray Connect applications to food and beverage, with special attention to different liquid matrix samples e.g. fruit juices, soft drinks or vinegars.