

Continuous Flow Pyrolysis Techniques for the Isotopic Measurements of Oxygen-Deuterium in Waters and Organic Compounds

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The technique of interfacing an elemental analyser to a stable isotope ratio mass spectrometer has since its inception in 1983 (Preston and Owens) proved a remarkably versatile analytical tool for the measurement of carbon and nitrogen isotopes across a wide application base. By 1994 sulphur isotopes had been added to the list and more recently those of oxygen and hydrogen. The analysis of oxygen and hydrogen involved a departure from the normal flash combustion mode of operation to one of pyrolytic thermal decomposition of the sample. This

work describes the application of the technique to the measurement of hydrogen and oxygen isotopes across an extensive range of isotopic values. The different technical solutions for complete pyrolysis are presented. Accuracy and precision of this new technique are discussed and compared with the performances of the traditional dual inlet techniques. Samples such as chlorinated hydrocarbons, simple organic samples such as cellulose, biotite; phosphates, nitrates have also been analysed with this technique and the different sets of results are presented.