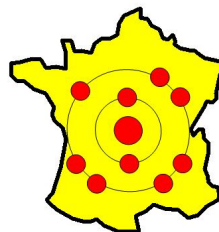




RÉSEAU FRANÇAIS DU FLUOR



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Laboratoire de Géochimie des Isotopes Stables

Team : Isotope Geochemistry of Gaseous fluorides

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Keywords : Preparation, conversion and purification of gaseous fluorides (Si, S, Se, Mo, W, U); Analysis of their stable isotope ratios using (high-resolution) gas-source mass spectrometry

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Development of gaseous fluorides isotope geochemistry

Aim 1: Establishing the chemical methods to extract, purify, convert various elements (e.g. Si, S, Se, Mo, W, U) and measure their isotope compositions with improved precision using high-resolution gas source mass-spectrometry.

Methods:

- *Chemical extractions (typically wet chemistry) to recover the element of interest*
- *Fluorination using purified gaseous F_2 or BrF_5*
- *Cryogenic separations of gaseous mixtures (e.g. F_2 from SF_6)*
- *Gas chromatography purification to separate the molecule of interest from minor impurities (e.g. SF_6 from C_3F_6 which would lead to isobare interference at $m/z = 131$ on which the rare ^{36}S -abundance is measured)*
- *Stable isotope ratio measurements using gas source ion-ratio mass spectrometer (Thermo-Finnigan MAT253 and MAT253-ULTRA (delivered end 2015))*

Aim 2 : Development of gaseous fluorides isotope geochemistry and its application to Earth sciences

- *Identifying the processes associated with stable isotope fractionations of heavy stable isotopes (e.g. role of nuclear volume effect, adsorption effects, kinetic vs. equilibrium effects)*
- *Isotope fingerprinting*
- *Applications to understand the Earth' origin and evolution with a focus on the application of S, Se, Mo, W and U as tracers of redox variations*