Mantle metasomatism *vs* host magma interaction: The ongoing controversy

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Mantle-derived xenoliths brought up to surface by intraplate magmatism, are an essential source of information about the nature and evolution of mantle. Since the Seventies they are considered from the scientific community precious material to study the processes affecting the mantle domain that they represent, particularly mantle metasomatism. However, on the basis of major element compositions of the phases, recent studies contrast the efficacy of this approach in studying the state of the mantle, concluding that most of the metasomatic textures which include alkali-silicate glasses are erroneous interpreted as effects of mantle metasomatism. They are instead interpreted as textures imposed on the xenoliths during magma transport and/or residence in a magma chamber. The most common features of metasomatised mantle-derived xenoliths are the occurrence of spongy texture of the peridotitic minerals, frequently associated with glassy patches. Various explanations on their possible origin have been proposed on the basis of heterogeneous geochemical data set. They include: i) fluid-induced melting at mantle depths; ii) reactions induced by the influx of exotic melts into the lithospheric mantle and iii) interaction with host magma during the transport. The goal of this contribution is to reinforce the worth of studying mantle metasomatism analyzing mantle xenoliths, taking into account that the interaction between host lavas and mantle xenoliths exists and sometimes masquerades the processes occurring at mantle depth. To pursue this, it is important to find geochemical criteria to discriminate such processes in relation to the mode of formation of the most common metasomatic textures. In order to carry out modeling for geochemical discriminates, we use a selected group of mantle xenoliths from Cape Verde Island, which clearly show textural and geochemical features which can be related to metasomatic modifications at mantle depth. We propose an approach which include not only inter- and intra-major element compositions of minerals, but, most relevant, trace element and isotopic compositions in primary and “metasomatic” minerals and glasses, which provide a robust geochemical tool to efficiently investigate the mantle metasomatism behind the possibly curtain of the host lava interaction.

A fast and simple calibration method for organic carbon isotope analysis using continuous-flow EA-IRMS

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Stable isotope analysis of both organic and inorganic substrates has been widely used for a broad range of applications in such diverse fields as the earth sciences, environmental sciences, biology, archeology and forensics. In particular, application of stable isotope techniques to forensic science has greatly grown during the last decade. The continuous-flow elemental analyzer interfaced with an isotope ratio mass spectrometer (EA-IRMS) is currently used in forensic isotope analysis of a wide range of sample materials including soils, oils, explosives, drugs and foods. Continuous flow analysis using an elemental analyzer interfaced with an isotope ratio mass spectrometer is faster and requires much less material than conventional analytical methods. Although EA-IRMS is simple and fast, accurate calibration strongly depends on matching sample and reference peak heights by adjusting the sample weight. This study describes a new modification for calibration using only the major ion beam intensity (nA) without weighing each sample or increasing the number of reference materials. This work was supported by a grant (code 3-2-3) from the Sustainable Water Resources Research Center of 21st Century Frontier Research.