Improving and Simplifying Clumped Isotope Data Archiving, Corrections, and Evaluation using Easotope

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One of the major challenges facing clumped isotope expert is data treatment in a time efficient and consistent manner. This problem is compounded by the fact that clumped isotope data acquisition is very long, and that data needs to be corrected using a series of external standards acquired over a period of several weeks. Ensuring consistency of the correction between individuals within a research group becomes problematic, and inter-laboratory consistency even more so. A further complication is that the recent pressure baseline methods (PBL) developed for non-linearity correction (He et al 2012, Bernasconi et al 2013) require corrections of the raw voltage intensities, which is time consuming thus limiting the ability to freely test different background selections for PBL.

Here, we present new software (“Easotope”) that addresses the problems faced by the clumped isotope community specifically, but also more generally by any community dealing with complex corrections for clumped isotope systems. Easotope is open-source, freely available software written in Java. The software is a full-fledged database that can store and read raw data files, can be run locally on a single computer, or distributed across a client-network architecture. Easotope is platform-independent, and at the time of writing this abstract runs as a “beta” version at Imperial College London (were it was conceived) and at the ETH Zurich. This practical demonstration will highlight the benefits of Easotope, which include a full archive and easy access to the raw data, ease and consistency of the corrections, transparency of data and references used in the corrections, graphical output, and the ability to explore alternative ways of correcting the data in a fraction of the time required with other softwares. Easotope handles heated gas corrections (Huntington et al 2009), projection into the absolute reference scale using both primary and secondary transfer function (Dennis et al 2011), pressure baseline correction using the “Chicago” (He et al 2012) and “Zurich” methods (Bernasconi et al 2013), acid fractionation correction for both bulk and clumped isotope data, and temperature calculation.


