



Exploring antimony isotope ratio variations for provenancing purposes

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Production sites and trade routes of Roman glass have received much attention over the past decade. It is assumed that raw glass was produced in primary workshops near the raw material sources used, to be transported to secondary glass houses. Colourless glass was a particularly prestigious material in this process, difficult to make. It has been looked at from the perspective of the provenance of its sand and flux, but rarely from the perspective of the origin of the decolorizing material. In effect, for the production of early Roman colourless glass, antimony was used, deliberately added under the form of Sb-bearing minerals. Isotopic analysis of Sb ores could help identify the origin of the decolorizing agent present in Roman glasses and, consequently, to reconstruct how such material was traded and transported, and how this can be integrated in the network of primary and secondary glass producers.

In this work, variations in the isotopic composition of Sb in different ore sources (stibnites) are explored using multi-collector ICP - mass spectrometry. A new method is proposed, where Sb is directly analysed for its isotopic composition using MC-ICP-MS after chromatographic isolation of the target element from a sample digest. The isotopic composition of the selected materials shows variations up to 6 ‰ relative to an antimony standard solution. Indium was used as internal standard for correction for instrumental mass discrimination and an external precision for the $^{123}\text{Sb}/^{121}\text{Sb}$ ratio of 0.01% RSD was obtained