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The need for reference materials certified for Hg isotope ratios

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Analytical advances in the past decade and the recent advent of multicollector inductively coupled plasma mass spectrometry (MC-ICP/MS) have made it possible to measure fractionation of non-traditional elements such as mercury. We have developed a suite of methods for accurate and precise determination of Hg isotope ratios in a wide range of environmental samples having sometimes only trace amounts of mercury. The recent observation of mass-independent fractionation of mercury isotopes presents additional challenges for precise isotope ratio measurements. In particular the absence of a certified references material complicates the comparison of data between different laboratories and underscores the necessity of stringent QA/QC measures to ensure the validity of the obtained results. While the Hg stable isotope community is gravitating towards using NIST 3133 SRM (Hg in solution) as a reference for all isotopic measurements of Hg, we propose the use of an additional secondary material with significant mass independent Hg isotope fractionation. This additional standard is urgently needed to a) calibrate the delta scale and b) serve as reference point for mass independent Hg isotope ratio determinations. This paper will provide Hg isotope ratio data for a variety of existing certified reference materials, with a focus on biological materials, where mass independent isotope fractionation is frequently observed.