



## **Stable isotope reference materials at the IAEA: current situation, developments and plans.**

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Historically the IAEA is a custodian of stable isotope-ratio measurement scales for the light elements (H, O, C, N, and S) and of primary (highest level) reference materials (RMs) used for the realization of these scales. All the stable isotope scales are based on artefacts. In this relation the major tasks include (i) maintenance and monitoring of the primary reference materials used for the scale realization; introducing their replacements as necessary, making value assignment for replacement-RMs in a metrologically correct way, with the lowest uncertainty possible; (ii) continuity and revisions of the scale-realizations, in particular in case of replacement RMs; (iii) developments, looking for new methods of the scale realisation as well as transition from the artefact-based to SI (International System of Units) traceable realisations.

Another group of tasks includes development and production of international secondary RMs, in particular addressing the most critical applications such as atmosphere monitoring, climate change and climate reconstruction studies. For these applications a family of RMs in the form of carbonate and CO<sub>2</sub> gases is required; these will cover a range of delta-13C and delta-18O values.

The third group of tasks includes RM-distribution and operational activities (dispatch, customer support etc).

In addition to all the above tasks, the RM-group at the IAEA pays attention to continuous improvements, establishing better Quality System and Quality Assurance, addressing requirements laid by ISO guides on RM production and characterisation as well as establishing links to metrology institutes.

The presentation will be focused on the current situation with stable isotope RMs at the IAEA, the latest developments and plans for new RMs.