

News about certified nuclear isotope reference materials at the Joint Research Centre – Unit G.2 (formerly IRMM)

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At the Joint Research Centre (JRC), Directorate G, the unit G.2 (Standards for Nuclear Safety, Security and Safeguards, SN3S), in Geel (Belgium), formerly called IRMM (Institute for Reference Materials and Measurements), is continuously engaged in the preparation and certification of nuclear isotopic reference materials.

In terms of uranium, the "best-sellers" like the ²³³U/²³⁶U Double Spike IRMM-3636 [1] are still very much appreciated. But the IRMM-183-187 series of uranium materials with ²³⁵U/U relative abundances below 5% is due for replacement. The re-certification of the IRMM-019-029 series of UF₆ reference materials [2] will be used for the preparation of new uranium solution reference materials suitable for TIMS and MC-ICPMS instruments, the so-called IRMM-2019-2029 series. The certified isotopic composition of the uranium solutions will be identical to the certified ratios of the UF₆ reference materials IRMM-019-029. These were determined using state-of-the art TIMS methods such as MTE (modified total evaporation [3]) and DS (Double Spike) and using gravimetrically prepared isotope mixtures for instrument calibration, and were confirmed by a second method, in this case UF₆-gas source mass spectrometry, as required by the ISO 17034. Using "process control measurements" by MTE it will be ensured that the isotopic composition is not changed during the preparation of the solutions.

References:

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- 2) S. Mialle, S. Richter, C. Hennessy, J. Truyens, U. Jacobsson and Y. Aregbe, *J Radioanal Nucl. Chem.* 305 (2015) 255-266.
- 3) S. Richter, H Kühn, Y Aregbe, M Hedberg, J Horta-Domenech, K Mayer, E Zuleger, S Bürger, S Boulyga, A Köpf, J Poths, K Matthew, *J. Anal. At. Spectrom.*, 2011, 26, 550.