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Production and characterisation of synthetic homogenous multi-element actinides samples via sol-gel as standards for mass spectrometry

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MetroPOEM [1] is committed to developing SI-traceable mixed element reference materials for the calibration of mass spectrometric devices. In nuclear forensics, elemental selectivity and precise spatially resolved mass spectrometry is essential for ultra-trace analysis of environmental samples. Resonant laser secondary neutral mass spectrometry (rL-SNMS) combines both element selective isotope ratio measurements and spatial resolution on the micrometre scale. Multi-element reference materials are needed to investigate different ionisation efficiencies for the elements important for environmental analytics.
In this work we present a production method of mixed actinide samples such as U, Pu and Am via sol-gel. These samples consist exclusively of the respective metal and fulfil the conditions for homogeneity confirmed by EDX and SIMS. The spatially resolved element distribution was determined using rL-SNMS. ICP-MS is also used to determine the element composition.
[1] MetroPOEM is a collaboration of 22 partners from 13 countries throughout Europe funded by EURAMET under grant number 21GRD09 https://www.npl.co.uk/euramet/metropoem

Workshop Themes

Sample analysis and standards

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