

# European Research Project MetroPOEM

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European Green Deal's ambition for zero pollution requires the development of highly sensitive techniques to detect ultra-low amounts of pollutants and to determine their isotope ratios. Mass spectrometry is a key method for non-radioactive polluting elements determination and is of increasing importance for long-lived radionuclides.

This project will bridge the gap between both methods and will establish new tools for tracing pollutants. Measurement uncertainties and detection limits will be significantly reduced using newly developed reference materials and SI-traceable measurement procedures with an immediate impact for tracking pollution sources by commonly available mass spectrometers.

Mass spectrometry is increasingly applied to measurement of medium and long-lived radionuclides to support end users in environmental radioactivity, nuclear decommissioning, nuclear forensics and paleoclimate applications. This technique offers a rapid measurement alternative to some decay counting techniques and it also expands the number of radionuclides that are measurable. As the popularity of mass spectrometry techniques for radionuclide measurement increases, it is critical that this is supported by underpinning standards. The aim of Work Package 3 is to provide two reference materials to test the capabilities of different mass spectrometric techniques for low-level radionuclide detection. This will inform end users of the relative strengths and limitations of different mass spectrometric techniques, as well as a comparison with decay counting techniques. A series of individual and mixed standards of key radionuclides (Strontium-90, Uranium and plutonium isotopes, Americium-241 and Neptunium-237) have been prepared at CEA and CMI with the support of NPL. These radionuclides were identified during formulation of the project, and a survey was completed by a number of laboratories on the activity levels of interest and their measurement capabilities.

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