

Trigger

# Basic Science for Metrology in Chemistry

Targets

Fundamental metrological needs (higher order & primary standards) for analytical tasks for the Horizon Europe programme pillars, as well as the EU Green Deal: Health, environmental protection (air, water ,soil) and climate change, energy  
Strengthen the relationships (interaction, communication) between relevant EMNs and TC-MC through transversal collaborations  
Developing Concepts for metrology in interrelated new fields of challenge with emerging metrological needs such as: Food safety, new diagnostics and therapies, surface- & micro/nanotechnologies  
Traceability for the end user in new application fields: point-of-care testing, monitoring, electromotive industries (e.g. battery SoH, SoC)  
Metrological needs for data handling, evaluation and storage related to chemical measurements (incl. metadata descriptors)  
Integration of artificial intelligence and machine learning in new application fields

Examples of products

systems for SI-traceability of chemical measurements incl. fit-for-purpose uncertainty tools

traceable, high quality methods, calibrants & matrix CRMs, isotope standards

Lower cost & faster traceable analytical measurements

traceable monitoring: in-vivo health care & environmental monitoring, system monitoring

Industrial appl.: traceable real-time in-line/on-line analysis

Measurement Requirements

measurements of complex compounds

multi-parametric measurements / reliable screening methods

Methods: trace-, species & protein analysis, based on, e.g., mass or optical spectrometry, utilising immunochemical tools; imaging techniques, nanoparticle counting techniques, isotopic measurements

Structures: new, integrated infrastructures for traceability in POCT and process monitoring, in - line, on – line, measurements process monitoring in industry & e.g. automotive systems

Sensors: POCT-devices for health monitoring, integrated & miniaturized devices, wearables, remote sensing, sensors for climate variables observation and pollution monitoring

Underpinning metrology activity

Implementing metrological methods & concepts

New primary and higher order methods for complex & emerging analytes for the Horizon Europe programme pillars

New traceability concepts (battery lifetime, Essential Climate Variables, biomarkers & proteins, ...)

Method defined measurands

New concepts for higher order methods in new fields of challenge (e.g. food safety, new diagnostics & therapy)

International comparisons to establish comparability  
Provide internationally accepted certified measurement capabilities to support traceable measurement results  
Define performance criteria to facilitate comparable measurements  
Better understanding of matrix effects and pre-analytical steps  
Establish a permanent exchange between the EMNs and TC-MC

2020

2025

2030

TIME