

Draft proposal for a Special Session at the ICMGP, Krakow, September, 2019

“Metrological Traceability for mercury analysis and speciation”

Proposed by

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The main purpose is to present the latest developments in the area of traceable mercury measurements worldwide. The session is intended for specialists in mercury analysis and speciation, users of measurement results, national metrology institutes and bodies/agencies responsible for standardization and reference methodologies, and producers of instrumentation.

*Mercury is a global pollutant and anthropogenic activities have significantly increased its presence at the global scale. Recently adopted international legislation intends to limit anthropogenic emissions and install instruments to reduce negative impacts of mercury in man and ecosystems at large. However, the infrastructure required to secure accurate measurements to assess concentrations and trends of mercury in different environmental compartments is still not in place. The special sessions proposed will address challenges in **measurement traceability** of mercury and its species, which is ultimately needed to secure comparability of the results at the global level.*

*Although significant improvements have been made in recent years, the progress on understanding **atmospheric mercury** is still hampered by uncertain measurements, especially when **speciation** is performed. The same applies to some other matrices, such as **water and biota**. In general, laboratory procedures and detection methods are well set and the true uncertainty can be reasonably described, however, uncertainties related to sampling are still a great challenge and need improvements before they can be applied appropriately in the global measurement infrastructure.*

The main topics to be addressed are:

- *Evaluation and comparison of existing and novel primary generation methods to obtain mercury gas standards, and validation and traceability of dynamic mercury vapour generators used for calibration of elemental Hg and oxidized Hg*

- *Traceability and reliability of measurements of mercury analysis and speciation in the gas phase (air, emission sources, etc.); with a special focus on oxidized mercury species*
- *Realization of traceable primary standards and the development of a facility to prepare gaseous mercury standards, including its measurement uncertainty budget*
- *Validation of stability and potential interspecies conversion at low and high Hg levels during sampling, sample handling and storage in air and other environmental matrices*
- *Metrology aspect in passive samplers*
- *Novel sensor development and comparability of measurements*
- *Field experience and needs by the user groups (researchers and industries)*
- *Traceability of bulk and compound specific isotope signature measurement methods*
- *Instrument producer perspectives in securing metrology support in mercury analysis and speciation*
- *Progress on standardized methods to harmonise the measurement of elemental and oxidized mercury in air*
- *Certified reference materials for calibration and validation*
- *International programmes in need for traceable mercury measurements*

We shall combine presentations from key metrological institutions worldwide, the participants of the EU project MercOx, its stakeholder group, leading research institutions world-wide in the area of mercury speciation analysis, instrument producers, reference materials producers, participants from standardization bodies as well as users of analytical results.

Tentative programme:

Preliminary plan for invited talks/posters:

Part A: Atmospheric part

1. *Introductory talk**: what are the analytical quality requirements in atmospheric mercury measurements (a representative from WMO, GEO group, GOS4M or IGOSP) (*Note: I guess that the Tekran group will have something similar in their emission monitoring part)
2. Evaluation and comparison of existing and novel primary generation methods to obtain mercury gas standards (PSA)
3. Validation and traceability of dynamic mercury vapour generators used for calibration of elemental Hg and oxidized Hg (VSL)
4. Validation of oxidized mercury calibration sources (Lumex)
5. Traceability of dry deposition measurements (CENAM)
6. Novel oxidized mercury sources using plasma source (JSI)
7. Metrology aspects of passive dosimeters (CNR-IIA)
8. SilcoTek coatings (SilcotechGMBH)
9. Traceability of bulk and compound specific isotope signature measurement methods for mercury in air (UPPA)
10. Traceability and uncertainty of mercury measurements in precipitation (CNR, JSI)
11. Mercury species transformation during sampling and its contribution to the measurement uncertainty (NC Bariloche)
12. Field testing: comparison in background sites (CNR)
13. Field testing: comparisons at point sources, cement production (VTT)

14. Metrology aspects in mercury sensors (IOS)
15. Validation of active and passive mercury measurements in air (NIES)
16. Uncertainty evaluation during sampling of mercury species in air (LGC)
17. Validation of activated carbon traps (JSI, PSA)

Part B: Quality requirements in monitoring programmes:

18. *Introductory talk*: Analytical quality requirements in monitoring programmes: role of Rms and CRMs (not decided yet)
19. ICI/EQUAS programme of the European human biomonitoring (JSI, RECETOX)
20. Progress of the new standard methods to harmonize atmospheric mercury measurements (ISO and CEN committee representative)
21. Interlaboratory measurements of Hg species in marine waters (MIO)
22. Traceability and uncertainty of Hg speciation in sea water (JSI)
23. New CRMs for mercury measurements in the marine environment (IAEA)
24. Certification of new certified reference materials for human biomonitoring (NIMD)
25. Certification of new RM in environmental matrices (UME TUBITAK)
26. New CRMs to support the implementation of Minamata Convention (NMI, S. Korea)
27. New CRMs in environmental samples (NMI China)

Based on previous years experience we expect about 12 additional abstract. Final programme to be prepared after all abstracts are received.