Hg analysis and speciation training course

Department of Environmental Sciences; Jožef Stefan Institute, Reactor Center, Brinje 40

9. - 20. July, 2018

(Location: www.rcp.ijs.si)

Transport arrangements for every day:
Bus transport from the Park Hotel to the Reactor Center will leave at 8:30 every morning
Bus transport form the Reactor Center to Park Hotel will leave at 17:00 every evening
Lunch break: 13:00 - 14:00; Morning coffee/tea break: 11:00 - 11:30; Afternoon coffee: available all afternoon

Instructors: Milena Horvat, Igor Živković, Jože Kotnik, Vesna Fajon, Ajda Trdin, Marta Jagodic, David Kocman, Janja Snoj Tratnik

Day 1 **9. July, Monday**	**Subjects**	**Notes**
Morning	**Welcome** (M. Horvat) **Introduction of participants and trainers** **Introduction** (M. Horvat) - Hg in the environment and human health - Monitoring in the context of the Minamata Convention - Effectiveness evaluation of the Minamata Convention **Environmental monitoring strategies** (M. Horvat)	Set the stage for the training
Afternoon	**Planning and sampling stages for air, water and soil sampling** (J. Kotnik) **Mercury analysis and speciation** (M. Horvat) **Validation of analytical methods** (M. Horvat) **Safety instructions at the Reactor Center** (V. Fajon) **Visit of the JSI Hg laboratories** (J. Kotnik, I. Živković)	Theoretical and practical examples will be provided
17:30 19:00	*Reception offered by JSI* *Departure to the Hotel Park*	
Day 2 **10. July, Tuesday**	Field and laboratory work – sampling and sample preparation	
Morning	**Water, sediments and soil:** Field sampling of sediments, water and soils (J. Kotnik) **Sampling of rain water (precipitation)** (J. Kotnik) Contamination free sampling demonstration	Field work Sampling strategy and demonstration of devices
Afternoon	**Sample preparation** (J. Kotnik, V. Fajon, I. Živković) - Drying and sieving of sediments and soils, homogenization - Natural waters (river and precipitation) samples preservation and storage **Laboratory ware cleaning procedures** (V. Fajon) Cleaning procedures for glass, and Teflon ware, and other materials for sample storage ***Preparation for the laboratory work in groups**** *The participants will be divided into groups according to their specified priorities and language skills*	Laboratory work General introduction will be provided; concrete steps will be demonstrated on specific days

Day 3 **11. July, Wednesday**	Laboratory work – sample preparation			* Groups defined on Day 2
Morning	Group 1* **Total Hg in water** (I. Živković) Sample preparation and digestion	Group 2* **Total Hg in soils and sediments and biota** (V. Fajon, A. Trdin) Sample preparation and digestion		Preparation of calibration standards and matrix CRMs, digestion
Afternoon	Group 1 **Total Hg in soils and sediments and biota** (V. Fajon, A. Trdin) Sample preparation and digestion	Group 2 **Total Hg in water** (I. Živković) Sample preparation and digestion		Preparation of calibration standards and matrix CRMs, digestion
Day 4 **12. July, Thursday**	Laboratory work – total Hg			Optional total Hg determination by ICP MS will be provided for biota, sediments and soils
Morning	Group A* **THg in soils and sediments** (J. Kotnik) Combustion and detection by CV AAS - Lumex	Group B* **THg in soils and sediments** (V. Fajon) Wet digestion and CV AAS detection	Group C* **THg in waters – precipitation and river water** (I. Živković) BrCl oxidation and detection by CV AFS	*Groups defined on Day 2 Calibration and measurements of Hg in (digested) samples
Afternoon	Group B **THg in soils and sediments** (J. Kotnik) Combustion and detection by CV AAS - Lumex	Group C **THg in soils and sediments** (V. Fajon) Wet digestion and CV AAS detection	Group A **THg in waters – precipitation and river water** (I. Živković) BrCl oxidation and detection by CV AFS	Calibration and measurements of Hg in (digested) samples
Day 5 **13. July, Friday**				Optional total Hg determination by ICP MS will be provided for biota, sediments and soils
Morning	Group C **THg in soils and sediments** (J. Kotnik) Combustion and detection by CV AAS – Lumex	Group A **THg in soils and sediments** (V. Fajon) Wet digestion and CV AAS detection	Group B **THg in waters – precipitation and river water** (I. Živković) BrCl oxidation and detection by CV AFS	Calibration and measurements of Hg in (digested) samples
Afternoon	Evaluation of the results (V. Fajon, I. Živković, M. Jagodic)			Results obtained will be calculated and evaluated by each participant individually
15. July, Sunday	Excursion to Idrija Mercury Mine (J. Kotnik)			Visit of the Mercury Mine in Idrija, Information Center and Museum, local food

Day 6 **16. July, Monday**	**Short introduction to Hg speciation** (M. Horvat)		Prior laboratory work a short introduction will be provided
All day	Group X* **MeHg in biota and sediments by GC ECD** (V. Fajon) Acid leaching, solvent extraction for GC ECD measurement	Group Y* **MeHg in water – sample preparation** (I. Živković) Solvent extraction and preconcentration of MeHg	* Groups defined on Day 2
Day 7 **17. July, Tuesday**	**Laboratory work**		
All day	Group X **MeHg in biota and sediments by GC ECD** (V. Fajon) Detection of MeHg in biota using GC ECD **MeHg in sediments by CV AFS** (V. Fajon) Acid leaching, solvent extraction and preconcentration for CV AFS detection	Group Y **MeHg in water - detection** (I. Živković) Determination of MeHg using derivatisation, room T preconcentration, GC separation and CV AFS detection (manual or automatic methods will be used)	*Optional:* acid extraction of MeHg in biota and detection by CV AFS automated system Tekran (A. Trdin)
Day 8 **18. July, Wednesday**	**Laboratory work**		
All day	Group X **MeHg in sediments** (I.Živković) Determination of MeHg using CV AFS **MeHg in water – sample preparation** (I. Živković) Solvent extraction and preconcentration of MeHg	Group Y **MeHg in sediments by CV AFS – sample preparation** (V Fajon) Acid leaching, solvent extraction and preconcentration for CV AFS detection	*Optional:* acid extraction of MeHg in biota and detection by CV AFS automated system Tekran (A. Trdin)
Day 9 **19. July, Thursday**	**Laboratory work**		
All day	Group X **MeHg in water - detection** (I. Živković, V. Fajon) Determination of MeHg using derivatisation, room T preconcentration, GC separation and CV AFS detection (manual or automatic methods will be used)	Group Y **MeHg in sediments - detection** (I.Živković, V. Fajon) Determination of MeHg using CV AFS	Optional: THg measurement in air for those that expressed interest
Day 10 **20. July, Friday**	**Presentations of the results**		
Morning	**Uncertainty evaluation in the measurement process - introduction** (J. Snoj Tratnik, I. Živković) **Evaluation of the measurement uncertainty** (I. Živković, J. Snoj Tratnik, A. Trdin) **Data presentation and evaluation** (David Kocman)		Practical examples for measurement uncertainty evaluation
Afternoon	Troubleshooting (all) Assessment of the training course Distribution of certificates, final remarks		