

TRACE ELEMENT SPECIATION TRAINING COURSE

Department of Environmental Sciences, Jožef Stefan Institute,
Reactor Center, Brinje 40, 1262 Dol pri Ljubljani,
and Jamova cesta 39, 1000 Ljubljana
15-26 October 2018

(Location: Reactor Centre www.rcp.ijs.si, Jamova www.ijs.si)

INSTRUCTORS

Milena Horvat, Radmila Milačič, Matic Bergant, Katarina Marković, Tea Zuliani, Zdenka Šlejkovec, Darja Mazej, Igor Živković, Ajda Trdin, Marta Jagodic, Janja Snoj Tratnik

Administrative assistance: Maja Šukarov

BREAKS

Morning coffee/tea break: 11:00-11:30, lunch break: 13:00-14:00, afternoon coffee: available all afternoon

PROGRAMME

Day 1, Reactor 15 October, Monday	Subjects	Notes
Morning	Welcome (Milena Horvat) Introduction of participants and trainers Introduction to the training course (Milena Horvat) Validation of analytical methods (Janja Snoj Tratnik)	Setting the stage for the training
Afternoon	Proper use of CRMs (Milena Horvat) Uncertainty evaluation – introduction (Janja Snoj Tratnik) ISO Standard 17 025 (Polona Vreča) Laboratory safety (Vesna Fajon) Visit to the laboratories	Presentation of basic QA/QC procedures
Day 2, Reactor 16 October, Tuesday	Arsenic (Zdenka Šlejkovec)	
Morning	Introduction to arsenic speciation in environment and biological systems Arsenic speciation in food and water samples using HPLC-(UV)-HG-AFS <u>Laboratory work:</u> Extraction of arsenic compounds from fish	Lectures and laboratory work
Afternoon	<u>Laboratory work:</u> Anion exchange chromatography for As(III), As(V), MMA and DMA determination in liquid samples Calculation of results	Laboratory work
Day 3, Reactor 17 October, Wednesday	Arsenic	
Morning	<u>Laboratory work:</u> Extraction of arsenic compounds from fish – drying of extracts and final preparation for analysis Cation exchange chromatography for AsB determination in fish extracts Calculation of results	Laboratory work
Afternoon	Discussion of SOP, troubleshooting	Discussion

Day 4, Reactor 18 October, Thursday	Mercury	
Morning	Introduction to mercury cycling in the environment and health effects (Milena Horvat) Minamata Convention: effectiveness evaluation (Milena Horvat) Mercury analysis and speciation (Milena Horvat) <u>Laboratory work:</u> Preparation of the calibration standards for total Hg and MeHg determination (Vesna Fajon)	Lectures and laboratory work
Afternoon	Sample digestion for total mercury determination Extraction of MeHg from water (Vesna Fajon)	Laboratory work
	<i>Reception offered by the JSI</i> <i>Transport arranged for 18:30</i>	Reception
Day 5, Reactor 19 October, Friday	Mercury	
Morning	Mercury in water: Total mercury determination using double amalgamation (manual method) and automated systems (Vesna Fajon, Igor Živković)	Laboratory work
Afternoon	Mercury in water: MeHg measurement using manual method and automated method	Laboratory work
20 October, Saturday	Free time	
21 October, Sunday	Excursion to Idrija Mercury Mine – optional	
Day 6, Reactor 22 October, Monday	Mercury	
Morning	Mercury speciation in sediments and biota: Extraction procedure (Vesna Fajon)	Laboratory work
Afternoon	Mercury speciation in sediments and biota: Detection using CV AFS detectors (manual and automated) (Vesna Fajon, Igor Živković)	Laboratory work
Day 7, Jamova 23 October, Tuesday	Chromium	
Morning	Introductory lecture to Chromium speciation and basis of Cr speciation by HPLC-ICP-MS (Radmila Milačič)	Lectures
Afternoon	Visit to the laboratory, practical guidelines for determination of total Cr by ICP-MS (Tea Zuliani)	
Day 8, Jamova 24 October, Wednesday	Chromium	
Morning	Determination of total Cr in surface water and total Cr in human serum by ICP-MS; Practical examples how to overcome polyatomic interferences (Matic Bergant, Katarina Marković, Tea Zuliani)	Laboratory work
Afternoon	Calculation of results, evaluation of analytical data (Tea Zuliani)	
Day 9, Jamova 25 October, Thursday	Chromium	
Morning	Determination of Cr(VI) in tap water by HPLC-ICP-MS and evaluation of analytical data (Matic Bergant, Katarina Marković, Tea Zuliani)	Laboratory work
Afternoon	Determination of Cr(VI) by spectrophotometry and evaluation of analytical data (Katarina Marković, Tea Zuliani)	Laboratory work
Day 10, Reactor 26 October, Friday	Presentation of the results and closing session	
	Troubleshooting (all instructors) Assessment of the training course Distribution of certificates, final remarks	