

Report on CA 17136 INDAIRPOLLNET 2nd ECIs' Training School, May 24-26th, 2022, Hungary

The second early career investigator's (ECIs) training school of **Cost Action 17136** has been organized in Hungary between May 24-26th, 2022 as a joint venture of ELTE – Eötvös Loránd University, Budapest, Hungary, Markes International (vendor of air pollution oriented analytical instrumentation based in the UK) and its Hungarian distributor, **Kromat Ltd.**, as well as **FEPTTEST** laboratories (Székesfehérvár, Hungary). The three trainers were **Caroline Widdowson** (Markes), **Viktor G. Mihucz** (ELTE & WG4 leader of CA 17136) and **Anikó Vasanits** (ELTE). The rationale of involving other institutions than ELTE to this training relied on the initial idea to divide the training into three parts *cf.* **theoretical training, hands-on activities** at a GMP laboratory equipped with modern equipment for characterization of indoor air organic and inorganic pollutants as well as **evaluation of the acquired knowledge**. Moreover, linkage between indoor and outdoor air pollution was established by including a visit to the research facilities of **BpART – Budapest platform for Aerosol Research and Training** operating at Institute of Chemistry of ELTE under the leadership of **Imre Salma, Dsc**. Therefore, Day 1 and Day 3 activities were performed at ELTE, while Day 2 activities were run at FEPTTEST GMP laboratory in Székesfehérvár. On day 1, ECIs were introduced to traditional indoor air analysis as well as novel tendencies in determining organic pollutants with special emphasis on thermal desorption gas chromatography – mass spectrometry (TD-GC-MS) by **Caroline Widdowson**. In the second half of Day 1, ECIs were shown through presentations delivered by **Viktor G. Mihucz** how to carry out a multicomponent indoor air quality sampling campaign as well as theory of inductively coupled plasma mass spectrometry (ICP-MS) suitable for determination of chemical elements in fine fractions of particulate matter. On Day 2, practical demonstration on the operation of TD-GC-MS and ICP-MS has been showed to ECIs split into two groups with the help of **Paul Morris** (Markes) and **Réka Józsa & Erika Seres** (FEPTTEST), respectively. Involvement of FEPTTEST staff was necessary due to the GMP requirements of the hosting laboratory. On Day 3, besides the visit to BpART, ECIs were engaged in performing calculations using data collected on Day 2 offering them the possibility to discuss about the acquired knowledge, reporting and performing peer feedback under the guidance of **Anikó Vasanits** (ELTE). Day 3 was closed inviting ECIs to give their feedback on the agenda and activities performed. The availability of Markes International, Kromat Ltd. and FEPTTEST laboratory is, hereby, kindly acknowledged.



Viktor G. Mihucz
CA 17136 leader of workgroup
on analytical instrumentation for indoor air pollution (WG4)

Annexes

I. Pictures taken during the training

II. Agenda of CA 17136 INDAIRPOLLNET 2nd ECIs' Training School, May 24-26th, 2022, Hungary

III. Quiz performed on Day 3.

IV. Five finger method feedback instructions, transcript of the feedbacks as well as scanned feedbacks.

I. Pictures taken during training



Caroline Widdowson (Markes) presenting at ELTE



ICP-MS training at FEPTTEST Laboratory in Székesfehérvár



Group picture in Székesfehérvár



Group work at ELTE on Day 3

II. CA 17136 INDAIRPOLLNET 2nd ECIs' Training School, May 24-26th, 2022, Hungary

Day 1, Tuesday, May 24th, 2022

Venue: ELTE – Eötvös Loránd University, Lágymányos Campus, H-1117 Budapest, Pázmány Péter sétány 1/A, Faculty Boardroom, 7th floor, 7.18 (see pics at the end)	
9:00 – 9:05	Victor G. Mihucz (ELTE): Welcome address & Brief introduction of ELTE – Eötvös Loránd University
9:05 – 9:15	Victor G. Mihucz (on behalf of Nicola Carslaw): Overview on the CA17136 INDAIRPOLLNET Cost Action
9:15 – 9:45	Introduction of the trainees and trainers & Icebreaker activity: Whodunit?
9:45 – 11:15	Caroline Widdowson (Markes): Introduction to traditional Indoor Air analysis: <ul style="list-style-type: none"> The theory of Thermal Desorption Overview of Sampling Techniques & Strategy
11:15 – 11:30	Coffee Break 1.
11:30 – 13:00	Caroline Widdowson (Markes): Data Analysis <ul style="list-style-type: none"> Emerging contaminants – PFAS, Microplastics, SVOCs. What next? (Online, NRT, etc.)
13:00 – 14:00	Light lunch 1.
14:00 – 14:15	Optional visit to the Instrumental Analysis laboratories of the Institute of Chemistry, ELTE with Victor G. Mihucz
14:15 – 15:30	Victor G. Mihucz (ELTE): Challenges and opportunities for performing an indoor air sampling campaign: the OFFICAIR EU project approach
15:30 – 15:45	Break & Group picture
15:45 – 16:45	Victor G. Mihucz (ELTE): Elemental characterization of PM _{2.5} indoors by inductively coupled plasma mass spectrometry (ICP-MS)
16:45 – 17:00	Closure of Day 1 & Instructions for Day 2

Day 2, Wednesday, May 25th, 2022

Venue: FEPTTEST Laboratories, H-8000 Székesfehérvár, Bakony utca 4.		
Departure at 8:07 AM from Kelenföld Railway Station (terminus of subway Line N° 4) by train		
9:15 – 9:30 Arrival to FEPTTEST Laboratories , split into two groups & visit of the laboratories with Mr. Soma Szabó		
	Group A	Group B
9:30 – 11:30	Paul Morris (Markes) & FEPTTEST: Training on TD-GC/MS	Réka Józsa & Erika Seres (FEPTTEST) & Victor G. Mihucz (ELTE): Training on ICP-MS
11:30 – 11:45	Coffee break 2 provided by FEPTTEST Laboratories	
11:45 – 13:00	Practical training on TD-GC/MS	Practical training on ICP-MS
13:00 – 14:00	Light lunch 2. (package with 1 sandwich & 1 drink provided by ELTE)	
	Group A	Group B
14:00-17:00	Réka Józsa & Erika Seres (FEPTTEST) & Victor G. Mihucz (ELTE): Training on ICP-MS	Paul Morris (Markes) & FEPTTEST: Training on TD-GC/MS
17:00- 18:00	Optional visit to the downtown of Székesfehérvár (on foot) & travel back to Budapest by train (trains available until late evening, e.g., 9 PM)	

Day 3, Thursday, May 26th, 2022

Venue: ELTE – Eötvös Loránd University, Lágymányos Campus, H-1117 Budapest, Pázmány Péter sétány 1/A, Faculty Boardroom, 7th floor, 7.18	
9:15 – 9:30	Caroline Widdowson (Markes) & Anikó Vasanits (ELTE): Introduction to Day 3 activities: split into 4 groups: 2 working later on TD-GC-MS (Groups X & X+1), the other 2 on ICP-MS (Groups Y & Y+1)
9:30 – 10:00	Imre Salma (ELTE): Visit of Group 1 to Budapest platform for Aerosol Research and Training (BpART) (http://salma.web.elte.hu/BpArt/)
10:00 – 10:30	Imre Salma (ELTE): Visit of Group 2 to Budapest platform for Aerosol Research and Training (BpART) (http://salma.web.elte.hu/BpArt/)
10:30 – 10:45	Coffee break 2.
10:45 – 12:00	Group work on the acquired knowledge on TD-GC-MS (Groups 1 & 2) & ICP-MS (Groups 3 & 4): What is in the sample? & Where is the sample from? & Create a presentation (Groups X and Y, trainee's choice)
12:00 – 13:00	Light lunch 3.
13:00 – 13:15	Trainee representative of Group X: Report back on TD-GC-MS
13:15 – 13:20	Peer feedback from Group X+1
13:20 – 13:35	Trainee representative of Group Y: Report back on ICP-MS
13:35 – 13:40	Peer feedback from Group Y+1
13:40 – 13:55	Trainees' five finger feedback
13:55 – 14:00	Closure of training school

QUIZ

Toluene Calibration

Mass of Toluene (ng/mL)	Peak Area

Sample Data

[illegible]

Part B. Inductively coupled plasma mass spectrometry (ICP-MS) tasks

1. Indoor and outdoor PM_{2.5} samples were monitored continuously for one week by a researcher group in China, in order to identify the sources of indoor PM_{2.5} and to check which factors influence the concentration of indoor PM_{2.5} and chemical elements in residential houses in Beijing.

Table 1. Comparison of indoor and outdoor concentrations of PM_{2.5} and elements in smoking and non-smoking houses (median) in the non-heating season (NHS) and heating season (HS).

Constituents	Smoking in NHS (N=10)		Non-Smoking in NHS (N=37)		Smoking in HS (N=10)		Non-Smoking in HS (N=37)	
	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor
PM _{2.5} (µg/m ³)	66.9	59.0	53.5	70.6	129.3	72.0	54.6	91.8
Al (ng/m ³)	479.1	731.3	444.9	532.2	317.1	551.5	306.0	561.0
As (ng/m ³)	17.05	0.13	2.97	1.21	32.58	31.37	16.37	22.37
Ca (ng/m ³)	459.6	284.3	272.3	370.1	220.4	459.4	335.5	630.9
Cd (ng/m ³)	2.64	1.34	1.80	2.10	3.93	1.55	1.34	2.20
Cu (ng/m ³)	18.61	23.06	22.76	30.31	25.26	38.98	20.44	38.15
Fe (ng/m ³)	990	1578	726	905	673	785	575.6	1852
K (ng/m ³)	923	846	892	1158	1277	1193	962.1	1391
Mg (ng/m ³)	190.0	151.4	160.4	201.2	149.7	215.9	170.7	279.9
Mn (ng/m ³)	40.38	48.69	39.07	53.26	28.66	42.60	31.09	71.61
Na (ng/m ³)	428.5	376.4	388.7	472.4	492.1	593.8	455.5	700
Pb (ng/m ³)	112.4	114.9	105.6	140.5	85.17	98.72	107.9	163.9
Se (ng/m ³)	5.21	4.21	3.86	5.54	1.44	3.91	2.48	5.09
Ti (ng/m ³)	1.15	1.12	1.11	1.31	0.74	0.88	0.72	1.16
V (ng/m ³)	2.10	2.43	1.71	2.43	1.80	2.09	1.22	2.40
Zn (ng/m ³)	254.3	189.8	229.3	271.5	144.6	185.2	218.2	333.0

Table 2. Factor analysis for indoor PM_{2.5} (all seasons).

Elements	F1	F2	F3	F4	F5
Al				0.71	
As					0.83
Ca			0.92		
Cd	0.72				0.56
Cu	0.60	0.53			
Fe	0.89				
K		0.72			
Mg			0.54	0.61	
Mn	0.74	0.45			
Na				0.74	
Pb		0.78			
Se		0.78			
Ti		0.82			
V	0.78				
Zn			0.86		
Eigenvalue	5.02	2.32	1.98	1.12	1.07
% of variance	21.55	21.28	13.80	11.37	8.79
Cumulative %	21.55	42.82	56.62	68.00	76.78
Possible source type	Combustion	A	Indoor cooking	B	C

Based on these results, a factor analysis was performed in order to identify the possible source types of indoor PM_{2.5}.

Five factors (F1-F5) were extracted from indoor elements data in PM_{2.5}, which explained about 76.8% of the total variance. Pair the missing source types with the letter of the following alternative source types:

- 1, Indoor smoking:
- 2, Dust and soil:
- 3, Motor vehicles and combustion:

2. Aluminium is a monoisotopic element (^{27}Al , 100% abundance). Possible polyatomic interferences for determination of Al by ICP-MS analysis are, for example, $^{12}\text{C}^{15}\text{N}^+$, $^{13}\text{C}^{14}\text{N}^+$, $^1\text{H}^{12}\text{C}^{14}\text{N}^+$. Below is the data gathered from yesterday's measurement. Plot the calibration curve *cf.* [CPS(Al)/CPS(ISTD)] vs. concentration. Do not forget the blank subtraction.

Concentration ($\mu\text{g/L}$)	^{27}Al [No Gas]	^{27}Al [He]	^{45}Sc (ISTD) [No Gas]	^{45}Sc (ISTD) [He]
Sample	CPS	CPS	CPS	CPS
Calibration blank	66041.40	86.50	4233142.37	61184.38
1	80653.34	106.46	4111803.58	61555.24
2	135333.65	206.26	4075031.92	59353.66
10	614738.04	928.21	4017542.00	60576.24
50	3004003.84	5134.18	4149404.63	63403.15
100	5875823.71	9937.22	4316435.37	66684.57
250	14862909.98	25302.59	4297478.70	67352.97
500	30039036.03	51203.51	4337585.88	68633.86
Procedural blank	871096.50	1583.64	5060444.86	83861.74
HI_37_17_WS	521972.09	921.55	4674174.48	80695.68
HI_37_18_WS	425077.26	861.67	4529705.29	80693.20
HI_37_19_WS	456068.10	901.59	5068984.56	87325.45
HI_37_17_MW	11261029.90	22583.43	4927666.87	91514.31
HI_37_18_MW	16784891.90	33896.74	4909668.08	93003.55
HI_37_19_MW	9700585.53	20031.25	4909270.44	93395.76

CPS = counts per second; ISTD = Internal standard.

Additional data for calculation

Teflon membrane filter code	PM mass [μg]	Sampling Environment	PM Fraction	filter mass (g)	MW fraction (g)	Water-Soluble fraction (g)
HI_37_17	1113.0	Industrial	PM _{2.5}	0.1266	0.0628	0.0630
HI_37_18	1208.5	Industrial	PM _{2.5}	0.1302	0.0677	0.0627
HI_37_19	1199.2	Industrial	PM _{2.5}	0.1267	0.0621	0.0652

Calculation of the total element concentration (mg/kg)

$$C = C_{\text{solution}} \times V_{\text{solution}} \times \frac{m_{\text{Teflon membrane, total}}}{m_{\text{Teflon membrane filter, MW or WS}}} \times \frac{1}{m_{\text{PM}_{2.5}, \text{ total microbalance}}}$$

$V_{\text{solution}} = 5 \text{ mL}$

3. Problem space: Human beings, for example, vulnerable groups such as the elderly, infants and people with chronic diseases, spend about 90 per cent of their time in enclosed spaces, most of which are in buildings with limited space and inadequate indoor environmental quality that can lead to fatigue and other adverse health symptoms.

Methodology & results: The ICP-MS analysis of a PM_{2.5} sample collected onto a quartz fiber filter for 10 days in a common room located in an elderly home by ICP-MS after microwave-assisted aqua regia acid digestion and sonication provided the following results:

Element symbol	concentration (mg/kg)		
	<i>pseudo</i> total	water-soluble	Crustal rock composition (mg/kg)
Cd	8.5 ± 0.4	3.09 ± 0.01	0.2
Co	30.6 ± 7.9	1.80 ± 0.04	25
Cr	1292 ± 49	22.6 ± 5.6	100
Cu	241 ± 80	63.4 ± 12.3	55
Fe	148910 ± 10018	144 ± 24	50000
Mn	1926 ± 267	45.7 ± 2.0	950
Mo	<LOQ	5.9 ± 1.1	n.a.
Ni	936 ± 171	40.6 ± 5.9	75
Pb	439 ± 146	81.7 ± 11.4	13
Rb	2050 ± 15	29.7 ± 0.4	90
Sb	95.5 ± 15.5	39.1 ± 1.3	0.2
Sn	<LOQ	46.4 ± 2.0	n.a.
Sr	563 ± 16	64.6 ± 5.3	375
V	858 ± 3.7	33.7 ± 0.1	135
Zn	1161 ± 388	541 ± 17	70

LOQ = limit of quantitation. Crustal rock composition according to Moore and Mason has also been provided.

Questions and tasks:

1. Why was determination of Al not possible in the samples?
2. Calculate the water-solubility percent of the elements determined in the sample. Which elements presented larger water-solubility? Discuss with your peers what could be the reasons for that for 3 elements.
3. Calculate the crustal enrichment factor for the elements determined indoors. Based on the results calculated, the occurrence of which elements can be related to anthropogenic activities and which ones to resuspension of soil dust?
4. In spite of the fact that sampling was performed in a commonly shared space by the elderly, one banned activity in public spaces was on-going. What could be that activity?
5. The concentration of major inorganic ions by ion chromatography in the water-soluble fraction in the elderly home as well as in an office in Budapest, Hungary, was the following:

Ion	concentration ($\mu\text{g}/\text{m}^3$)	
	Elderly home	Office in Budapest
Cl^-	0.31	0.06
NO_3^-	0.50	1.58
SO_4^{2-}	4.20	2.40
Na^+	0.57	0.11
NH_4^+	1.10	0.73
K^+	0.12	0.11
Ca^{2+}	0.33	0.27
Mg^{2+}	0.02	0.07

Based on the major inorganic ion concentration, indicate the possible location of the elderly home.

- rural where biomass burning was performed during PM sampling
- urban next to an oil refinery
- the elderly had a nice view from their window to the sea
- urban next to a coal combustion-based power plant

IV. Five finger feedback – instructions



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Transcript of the feedback of participants

What went well? - Organization practical work in laboratory

What caught my attention? What would I like to add? - TD GCMS

What went wrong? Negative feedback? - Nothing went wrong

What do I take home? - Knowledge about TD GCMS

What did not get enough attention? - Other techniques for the termination of indoor air pollutants

What went well? – Experiments, laboratory visit

What caught my attention? – chemistry, experiments

What went wrong? Negative feedback? - stand on food too long

What do I take home? – TD-GCMS, ICPMS very new for me
What did not get enough attention? - I need to work on calculations

What went well? – everything
What caught my attention? – the lectures
What went wrong? Negative feedback? - nothing
What do I take home? – knowledge
What did not get enough attention? - nothing

What went well? - laboratory part I really liked experiments and instrument fashion show. Sampling demonstration and tasks in the end of course.
What caught my attention? – Laboratory, instruments, lecturers expertise
What would I like to add? - More tasks like the last one where we had to calculate actual pollution in environment
What went wrong? - This time nothing
What do I take home? - Everything. I really liked this course and laboratories and tasks. I learned a lot
What did not get enough attention? - Maybe health effects but for that you need health specialists. Yes, pollution connection to health effects.

What went well? - I really like the family atmosphere everybody in the group and trainers are very nice people. I also like the way this training was divided first we get some theoretical base later we did practical training and at the end we shared the results. I also very liked coffees and lunch breaks. The training was very good organized.
What caught my attention? - The most I liked the second day where we went to the company and we could see the work outside of the Academy. I really learned a lot of new things.
What went wrong? - Nothing
What do I take home after this training I have really a lot of ideas I get the new knowledge in my research field and also new contacts
What did not get enough attention? - Nothing.

What went well? - In my opinion everything was really good and well organized
What caught my attention? - Knowledge about TD GCMS and new friendship
What went wrong? - Nothing went wrong
What do I take home? - My attention called ICPMS. It was really good presentation and demonstration about it
What did not get enough attention? - Everything went well organization group atmosphere it was really good everything nothing went wrong

thank you so much. A really good experience
What went well? - everything

What caught my attention? - very interesting visit at FEPTTEST

What went wrong? -really good experience but too much information in three days another day would be great

What do I take home? - lot of things GC very useful because we have one in our lab

What did not get enough attention? - again an extremely good experience but more lab work I know it is difficult maybe

What went well? - I thought the location was very good not often these things are hosted in Hungary. Good length of time 2.5 days perfect. Really enjoyed it. Victor was an incredible host very knowledgeable and great man

What caught my attention? - I thought the trip to the successful here were lab was cool getting to see an industrialized lab not just an academic 1

What went wrong? - although I like the lab you were on your feet for most of the day and you could see people were very tired

What do I take home? - the different analytical sampling methods for air pollution how when why where to use them and got an in depth look at the instruments and sampling in action

What did not get enough attention? - not much really maybe talk more about IC HPLC but I think everything was covered in good detail

What went well? - overall organization was super the practical lab visit and activity was very beneficial. Lectures were informative especially the ones about different pollutants and how to detect and evaluate them.

What caught my attention? The training on using GCMS caught my attention it was very effective although time was short, but we learned a lot. I would add some practical parts where participants can use other tools or equipments, sensors

What went wrong? - really, I don't have any negative point to mention

What do I take home? - I take home a lot of things such as new relationships lots of knowledge about indoor air I know how to use and interpret data from GCMS great idea came to my mind for my future work during draining

What did not get enough attention? - the ICP training for me was not totally informative maybe because of lack of knowledge I had about it

What went well? - the organization (three-day program theory hands on analysis)

What caught my attention? - mostly day three ambient PM banana curve sorry Peter you were perfect but possible I will use this banana thing

What went wrong? - in the day two the lab didn't have enough chairs

What do I take home? - and lots of new knowledge

What did not get enough attention? - ?

What went well? - I learned a lot of new things out of my normal skills

What caught my attention? - the experience at the platform for aerosol research and training

What went wrong? - I didn't receive the last program but it is not a real problem

What do I take home? - that I've lot of things to learn

What did not get enough attention? - nothing to report

What went well? - overall thank you very much for this amazing training

What caught my attention? - I've got a lot of experiences from this training such as to meet amazing mentor meet new friends from another country and of course I learn about air indoor pollution

What went wrong? - there is negative feedback, but I think it is necessary to give more group tasks maybe one task per day

What do I take home? - I do love the lab visiting and watch volunteer do something like preparation of sample etc.

What did not get enough attention? - nothing

What went well? - all went well

What caught my attention?

What went wrong? - I would have liked to do some real more lab works

What do I take home? - I learned a lot of about sample preparation and instrumentation

What did not get enough attention? -

What went well? - in my opinion this ECI training school was generally organized very well. I really appreciated the visit at the FEPTTEST laboratory because in this way we had the possibility to see the instrumentation used for sampling and especially for the analytical determinations.

What caught my attention? -The practical demonstration totally caught my attention since I could discuss about some problems during analysis make some questions and obtain satisfying responses. Also, the lectures were presented in a comprehensive and exhaustive way although this first part was more boring. I really like also the quiz performed during the third day it was engaging and we had the possibility to discuss about what we saw in the practical activities. Thanks!

What went wrong? -

What do I take home? -

What did not get enough attention? -

What went well? - everything thanks for this nice location

What caught my attention? tubes sampling

What went wrong? - sometimes program was too long to hold attention

What do I take home? - maybe I try to add some new methods for my research

What did not get enough attention? - microbial contamination measuring

What went well? - everything was well the lectures were well prepared interesting

What caught my attention? - the preparation of the samples and their analysis caught my attention

What went wrong? - don't get me wrong I want to give you this information, but everything was perfect

What do I take home? - I will take a new knowledge more respect for chemists

What did not get enough attention? - instrumentation and instruments were not my cup of tea not the presentation but still very important. Thank you!

1. What went well?
laboratory part.
I really liked experiments
and instrument, fashion show
Sample Sampling demonstration
and tasks in the end of course

2. What caught my attention?
laboratory, instruments
Lecturers expertise
What would I like to add?
More tasks like the last one
where we had to calculate
actual pollution in environment.

3. What went wrong?
This time nothing

4. What do I take home?
Everything. I really liked this
course and laboratories and
tasks.
I learned a lot.

5. What did not get enough attention?
Maybe health effects, but
for that you need health
specialist.
Yes, pollution connection to
health effects.

TP-GCMS
Nothing went wrong
Knowledge about
D-GCMS
Other techniques
for determination of
pollutants
Determination of
pollutants in
environment

DON'T GET ME WRONG!
I WANT TO GIVE YOU THIS
INFORMATION!
BUT... EVERYTHING WAS PERFECT !!!

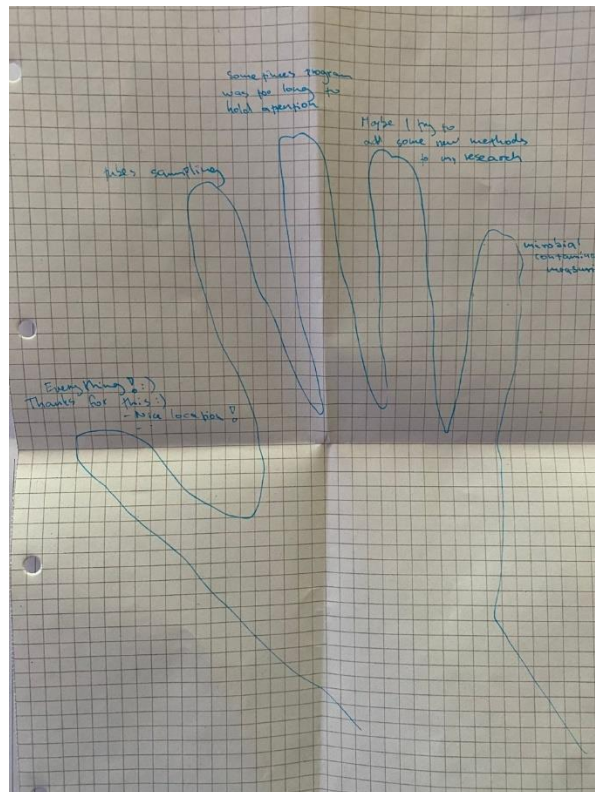
THE PRESENTATION
OF THE SAMPLES
AND THEIR ANALYSIS
CAUGHT MY ATTENTION

EVERYTHING WAS WELL
THE LECTURES WERE
A WELL PREPARED
INTERESTING

I WILL TAKE A NEW
KNOWLEDGE.
MORE RESPECT
FOR CHEMISTS!!

INSTRUMENTATION
AND INSTRUMENTS
WERE NOT
MY CUP OF TEA
NOT THE PRESENTATION!
BUT STILL VERY IMPORTANT

THANK YOU !!!



In my opinion, this EA training school was generally organized very well.

I really appreciated the visit at the Eptast laboratory because in this way we had the possibility to see the instrumentation used for sampling and especially for the analytical determinations. The practical demonstration totally caught my attention since I could discuss about some problems during analysis, make some questions and obtain satisfying responses.

Also the lectures were presented in a comprehensive and exhaustive way, although this first part was more "boring".

I really like also the part performed during the third day; it was engaging and we had the possibility to discuss about what we saw in the practical activities.

Thank!

I would have liked to do some real/more lab work.

I learnt a lot about sample preparation and instrumentation.

All went well.

The only bit of feedback from this training, which I really enjoyed, was that I was a bit out of sync with the rest of the group. I think it is necessary to give more of these things to the group.

Overall, Thank you very much for this amazing training.

I do love the lab, writing and using the equipment, the preparation of sample, etc.

Nothing to report!!

What did not get caught attention?

What I do take home?

That I've got a lot of things to learn!!

What went wrong? Negative feedback.

I didn't receive the (last) program, but it is not a real problem.

What caught my attention? What should I like to add?

The experience at the Platform for Aerosol Research and Training.

I learned a lot of new things out of my normal skills.

What went well?

In the day-2
the lab didn't
had enough
chairs

Lots of new
knowledge

Mostly day-3
Ambience PM
Banana Curry
(Sorry Peter
you were perfect
but possible
I will ~~use~~
use the banana thing

The organization
(3 day program)
theory - hands on
- analysis

daily to don't have any negative point
in action.

2. Take time - enjoying thing
→ Relaxation after
→ lot of knowledge about Endocrine
→ it should not be too hard
→ it should be fun
→ it should be interesting
→ it should be useful
→ it should be practical
→ it should be easy to understand
→ it should be easy to remember
→ it should be easy to apply

3. Take time - enjoying thing
→ Relaxation after
→ lot of knowledge about Endocrine
→ it should not be too hard
→ it should be fun
→ it should be interesting
→ it should be useful
→ it should be practical
→ it should be easy to understand
→ it should be easy to remember
→ it should be easy to apply

I thought the trip to the
Szekesfehervar lab was cool,
getting to see an industrialized
lab, not just an
academic one.

Although I liked the lab, you
were so far for most of the
day and you could see people
were very tired.

The different
analytical sampling methods
for air pollution. How,
when, why, where
to use them. And
got an in-depth look
at the instruments +
sampling in action.

I thought the location was
very good, not far from the
airport in Hungary.

Good length of
time (2.5 days) perfect.
Really enjoyed it.

Viktor was an incredible host,
very knowledgeable + great man.

Not much really,
maybe talk more about
it / more, but I
think everything was
covered in good detail.

THANK YOU SO MUCH. A REALLY
GOOD EXPERIENCE

REALLY GOOD EXPERIENCE BUT TOO
MUCH INFORMATION IN 3 DAYS. ANOTHER DAY
WOULD BE GREAT

VERY INTERESTING
VISIT FORTHEP

EVERESTH

LOT OF THING, GC VERY
USEFUL BECAUSE WE
HAVE ONE IN OUR LAB

WAS AN EXTREMELY
GOOD EXPERIENCE BUT
MORE LAB WORK / I KNOW
IS DIFFICULT MAYBE

Nothing went wrong!

Knowledge about TD-GC/MS and new friendship.

In my opinion everything was really good and well organized!

My attention caught ICP-MS. It was really good presentation and demonstration about it.

Everything went well! Organization, group, atmosphere. It was really good everything!

What caught my attention?

After the first day, where he went to the company and we could see the work outside of the academy. I really learned a lot of new things.

What went well?

I really liked the family atmosphere, especially in the past and trainers are very nice people. I also like the way this training was divided - first we got some theoretical base, later we did practical training and on the end we shared the results. I also very liked coffee and lunch breaks ☺

The training was very good organized!

What went wrong?

Nothing

What do I take home?

After this training I have really a lot of ideas, I got the new knowledge in my research field and also new contacts.

What did not put enough attention?

