

The mission of IRMM is to promote a common and reliable European measurement system in support of EU policies.

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Contact:

EUROPEAN COMMISSION
DIRECTORATE-GENERAL JOINT RESEARCH CENTRE
Institute for Reference Materials and Measurements

Retieseweg 111, B-2440 GEEL (Belgium), Tel.: +32-(0)14-571 605, Fax: +32-(0)14-571 863
e-mail: philip.taylor@cec.eu.int
<http://www.irmm.jrc.be>



Number 7

MiC Newsletter

Editorial

Inspiring vision

A clear vision is needed to make possible the mobilisation of people for a project. Strategies and technical plans are quite essential, but are only relevant after you know where you want to go to - when you are inspired by your vision.

We all know that reliable chemical measurements are needed in many different domains across the society. And that competence of people is probably the most important factor to secure this reliability. Competence building should, amongst others, take place in our universities. With analytical chemistry lecturers becoming an endangered species in many European universities, this poses quite a challenge.

In the area of standardisation, the European Commission is promoting appropriate education via an initiative like http://europa.eu.int/comm/enterprise/standards_policy/academic_network.

In the area of measurements, the IRMM brought together some 40 academics teaching the metrology and the Q/A aspects of analytical chemistry in a Summer School in Rogaška Slatina (Slovenia). You find a summary of this event inside this edition of this newsletter.

This Summer School was the launch of a pan-European initiative called 'AcadeMiC'. The participants formulated and now share the vision to create a European forum, where analytical chemistry lecturers can meet and share ideas and best practice for teaching and promoting metrology and QA/QC aspects in chemical measurements.

It was encouraging to experience the enthusiasm of these people which is bound to make a difference. And it was comforting to see that our vision is shared and is inspiring many others.

Dr. Philip Taylor
Chairman of the TrainMiC Editorial Board



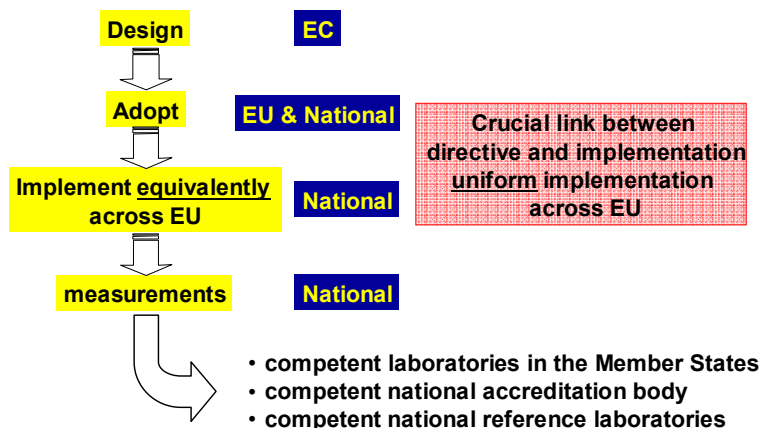
September 2005

What is TrainMiC ?

- **vision :**
 - we want TrainMiC to be a European shareware product/process for training in generic issues related to the measurement science in chemistry
- **our purpose :**
 - to facilitate the training about metrology in chemistry to interested parties (e.g. metrology organisations, educators, decision-makers and accreditors) in order to strengthen the measurement infrastructure, so that trustworthy results are produced, which avoids economic or societal waste.



Directives requiring measurements for implementation



Do we need AcadeMiC? Comments from Poland

Danuta Baralkiewicz and Ryszard Świetlik, Members of Polish TrainMiC team



Danuta Baralkiewicz from Adam Mickiewicz University (UAM), Poznań: At the Faculty of Chemistry of UAM we realised that there is a demand from our students as well as students from the faculties of biology, geology and ecology (all who produce and/or apply i.e. chemical measurements) to understand the principal rules of the measurements issues, i.e. metrology. Our students are already aware of the importance of the reliability of analytical results, but up to now they didn't learn systematically how to achieve it. During the laboratory exercise

they learn that in all instrumental methods analytical signals have to be correlated with the amount of substance, which is in chemical measurements strongly depended on the matrix. However no information was given how to validate the analytical procedure and how to ensure the traceability of the results. Therefore, in our Faculty I introduced the course on MiC, based on the experience obtained via TrainMiC. I also would like to stress that the common work and exchange of experience with others university teachers from Warsaw, Białystok, Radom and Lublin was very helpful when introducing this new topic into the curriculum. Our students are attracted by learning about the metrology infrastructure, but also by understanding the link between the theory and practice related to the use of national and international standards and regulations.



Ryszard Świetlik from Technical University of Radom: At the Faculty of Environmental Protection the intention is to focus mainly on the use of chemical measurements in the field of environmental protection. The interest of our students is focused on areas where European Directives apply, particularly those where the chemical measurements are essential part of its execution. This was a driving force to introduce the MiC issue as a part of the curriculum for those who will be dealing with the implementation of the requirements of various Directives in Poland.

Therefore I found it as a very important but also very attractive for our students to implement the MiC in to the classes of 'Analytical chemistry' as well as 'Instrumental analysis'. Within lectures, tutorials, seminars and practical exercises various issues of metrological approaches could be presented in a practical way. What I would also like to stress is that when supervising diploma work, where the metrological approach is an essential part of the evaluation of the results and making conclusions on the environmental conditions, could be also a good opportunity to disseminate the MiC issue.

Both academic lecturers from Poland, Danuta Baralkiewicz and Ryszard Świetlik, were successful in implementing MiC in the curriculum and did this in an attractive way. They therefore consider the common European platform AcadeMiC as a powerful tool to exchange experiences.

Quality cONTROLL book
Bertil Magnusson



Internal quality control involves a continuous, critical evaluation of the laboratory's own performance and working routines. The control encompasses the process starting with the sample entering the laboratory and ending with the report. The most important tool in this quality control is the use of control charts. The basis is that the laboratory runs control samples together with the routine samples. The control values are plotted in a control chart. In this way it is possible to demonstrate that the measurement procedure performs within given limits. If the control value is outside the limits, no measurement results are reported and remedial actions have to be taken to identify the sources of error, and to remove such errors. Figure 1 illustrates the most common type of control chart, the X-chart.

The cONTROLL book content

- What is QC
- Principles of internal QC
- The use of QC
- The X and R charts
- Control samples
- Setting the control limits
- Daily interpretation of QC
- Long term use of QC data

In the beginning of 2006 a Quality Control module will be ready based on a Nordtest report issued in 2005. (downloadable from <http://www.nordtest.org>)

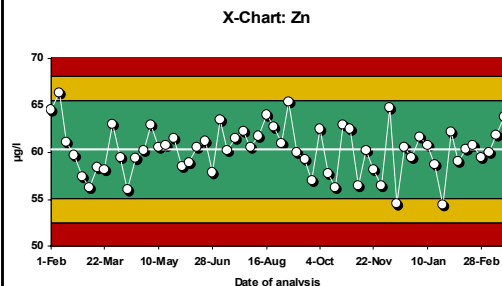


Figure 1. Example of an X control chart for the direct determination of zinc in water. All control values in the middle area (green, within the warning limits) show that the determination of zinc performs within given limits and the routine sample results are reported. Control values in the dark grey area (red, outside the action limits) show clearly that there is something wrong and no routine sample results are reported. A control value in light grey area (yellow) is evaluated according to specific rules.

The 1st AcadeMiC summer school was organised in Rogaška Slatina (Slovenia) by the IRMM in collaboration with the Training and Education committee of the EURACHEM. Forty academic lecturers and ten participants from the stake holder organisations attended the event from 6th to 9th July 2005. Twenty-one countries were represented: AT, BA, BE, BG, CY, CZ, DE, EE, ES, FI, HR, IT, NO, PL, PT, RO, SE, SI, SK, TR, UK.

The summer school was officially opened by Prof. Jure Zupan, Minister of Higher Education, Science and Technology of the Republic of Slovenia (and former analytical chemistry professor). Press coverage of the event was given in the Slovenian newspaper Dnevnik, Novi tednik and published by the Slovene press agency as well as at the Ministry's internet page [http://www.mvzt.gov.si/index.php?id=233&tx_ttnews\[pointer\]=1&tx_ttnews\[news\]=828&tx_ttnews\[backPid\]=101&cHash=a0dd0ba2df](http://www.mvzt.gov.si/index.php?id=233&tx_ttnews[pointer]=1&tx_ttnews[news]=828&tx_ttnews[backPid]=101&cHash=a0dd0ba2df).

The scope of the event was explained by Dr. Philip Taylor. It is to create a European forum, where analytical chemistry lecturers can meet and share ideas and best practice in teaching Metrology in Chemistry (MiC) as well as in promoting it to students and getting support from funding and/or decision bodies.

The programme consisted of several lectures by invited speakers and three discussions themes:

1. Curriculum: What should it cover, related to Quality Assurance (QA) and MiC?
2. Pedagogy: How to teach it? Exchanging experience on methodologies (cf. validation / uncertainty / traceability)
3. Promoting and marketing: what content to attract students and how to convince your dean?

The following facts were observed:

- + there are many enthusiastic and experienced lecturers with good ideas;
- + many good pedagogic tools were developed and are available
- + new EU member states smartly exploited the Enlargement wave to increase the status of QA/MiC.

However,

- + an average European student has a fairly small chance to be fluent in ISO-17025 related topic
 - + many courses exist, but they is a big variation in availability and in content;
 - + no information platform is available to interlink and inform professors lecturing QA and MiC
- Unfortunately, analytical chemists have done poorly (if they ever tried) in influencing the EURO-curriculum that could be used as leverage.

The following actions, triggered by the Rogaška enthusiasm, are foreseen:

- + Continue and increase the collaboration between the academic lecturers at a pan-European level;
- + Identify the main key issues stressed in the "Bologna decision" and try to influence the "Euro Curriculum";
- + Improve the QA and MiC public relation toward decision makers, students and general public; and last but certainly not least
- + Issue a "**Rogaška Declaration**" resulting from the many very enthusiastic discussions held during this event.

And how is TrainMiC doing?

Piotr Robouch

While writing these few lines, the TrainMiC score board has being updated to show:

- 49 events were organised, - in 17 countries, - attended by 2040 participants!

And the end of the year is still far. Eleven additional events are planned before the end 2005 (see Table below) to which 250 participants are expected.

Would you have expected such an achievement in February 2001?

You will certainly remark reading through this Newsletter that five National TrainMiC teams (BG, CZ, PL, RO and SI) are actively lecturing in their native languages using their respective translated version of the TrainMiC course material.

After several years of successful events in the "new" Member States, it is interesting to notice that "old" Member States expressed in 2005 the interest to organise TrainMiC events. Two events were held in Vienna (March 05) and Helsinki (June 05) in collaboration with the respective National Accreditation Bodies (BMWA, AT and FINAS, FI). The success of these events can be demonstrated by the consequent request from both organisers to set up a National TrainMiC team in their country.

The reputation of the TrainMiC programme is slowly but surely spreading. Three events are planned in Brussels this autumn, in collaboration with renowned international organisations, namely: the European Committee for Standardization (CEN), the European co-operation for accreditation (EA) and the National Reference Laboratories for the detection of residues with participation of the Directorate-General for Health and Consumer Protection of the European Commission.

And TrainMiC certainly does not stop here. New modules are in preparation to cover relevant issues such as "interpretation of results v.s. legal limits"; "quality control" and "sampling". We hope to be ready by the end of the year, and we will keep you posted.

	Date	City	Country	# particip.	Comment
2005	60	2005/Dec	Prague	Czech Republic	
	59	2005/Nov	Nicosia	Cyprus	
	58	2005/11/06-08	Brussels	Belgium	EA
	57	2005/Nov	Poznan	Poland	
	56	2005/Oct	Brussels	Belgium	CRL
	55	2005/Oct	Radon	Poland	
	54	2005/Oct	Bucharest	Romania	
	53	2005/09/19-22	Brussels	Belgium	CEN
	52	2005/Sept	Black Sea	Bulgaria	
	51	2005/Sept	Bucharest	Romania	
	50	2005/Sept	Torun	Poland	
	49	23/08/2005	Geel	Belgium	CZ clinical lab participants
	48	29-30/06/2005	Sofia	Bulgaria	40
	47	15-16/06/2005	Helsinki	Finland	39 FINAS / MIKES
	46	24-25/05/2005	Pescara	Italy	15 5th Mediterranean Conf.
	45	17-18/05/2005	Palanga	Lithuania	33
	44	09-10/05/2005	Lavalette	Malta	18 EURACHEM Malta
	43	03-04/05/2005	Bucharest	Romania	25
	42	03-04/05/2005	Warsaw	Poland	18
	41	30-31/03/2005	Sofia	Bulgaria	35
	40	16-17/03/2005	Vienna	Austria	32 BMWA.at
	39	27-28/01/2005	Maribor	Slovenia	50 Balkan TrainMiC
	38	25-26/01/2005	Ljubljana	Slovenia	60 SLO Water Labs

Training in metrology in chemistry

Emilia Vassileva

In response to a growing interest on principles and applications of metrology in chemistry the eight edition of Training in Metrology in Chemistry (TrainMiC) seminar took place on **29-30 June 2005** in Sofia. Total of 40 participants attended this training course - 29 representatives from analytical laboratories, eight from national regulatory and accreditation bodies, eight from universities and other parties interested in measurements in chemistry. During the two days seminar six TrainMiC modules were presented by the Bulgarian TrainMiC team. The "determination of lead in a soil matrix by GF-AAS" was the subject of two parallel exercise sessions, dealing with 1) method validation and 2) uncertainty budget calculation.

Very good organisation and logistics were provided. The professionalism, enthusiasm and hospitality of the local organisers are greatly acknowledged. The analysis of the evaluation forms showed that the course and the TrainMiC training material (translated in Bulgarian language) were highly appreciated. Considering that more than 60 participants are already on the waiting list, an additional course is foreseen before the end of November.

TrainMiC course in Lithuania

Irena Vasaitiene, Lead Assessor of the Lithuanian accreditation

I had the pleasure to participate on **17-18 of May 2005** in training course Principles and applications of metrology in chemistry organized by IRMM in cooperation with Semiconductors Physics Institute in Palanga, Lithuania.

As the quality of chemical measurements is an important issue, permanent training of the laboratory personnel ensures their competence and increases the knowledge. Also technical assessors and lead assessors participating in the laboratories accreditation process shall have relevant qualifications and experience. Thus the participation in external trainings always is valuable.

The training course Principles and applications of metrology in chemistry was organized with high technical level. All training modules were very relevant for the laboratories and also for the accreditation body. Traceability of chemical measurement always being problematic for testing laboratories was presented in very acceptable and understandable way.

Explanation of statistics used for evaluation of measurement uncertainty and interpretation of the results of inter-laboratory comparisons enables laboratories to increase the understanding of these issues and allowed to improve the internal documents especially measurement uncertainty calculations.

Validation of measurement procedures are very important for chemical laboratories. Obtained experience during the training and training material will make easy to prepare validation procedures and also implementation of the standard EN ISO/IEC 17025.

All training material was well prepared and will be helpful for laboratories to increase their competence in metrology in chemistry and also for improvement of their quality system.

For me, as lead assessor this training course was very useful, because all training material is essential for implementation of standard EN ISO/IEC 17025. It would be useful to have similar training course in Lithuania, running on permanent basis.

I would like to express many thanks to lecturers Dr. P. Robouch and Prof. Dr. I. Leito. Training material was presented at a very high professional level. Also many thanks to coordinator Prof. A. Galdikas who organized this training in MiC in Lithuania.

PL TrainMiC Team meeting at IRMM in Geel

Ewa Bulska

The national PL TrainMiC team was set up at the end of 2003, with the aim to disseminate the knowledge in metrology in chemistry in Poland via TrainMiC courses. In order to provide the courses in our national language a need of the Polish version of all modules used in the frame of TrainMiC was recognised. Therefore the main task was to translate the text on the slides and to prepare the Polish edition of EUR 20841 EN Report.

For this reason we worked intensively for 3 days (**15 – 17 June 2005**) at IRMM. The preliminary draft translation was done in advance, now the main difficulty was to agree on terminology. Appropriate terminology is very important as it will be spread via TrainMiC courses over Poland. The second issue was to agree on the content of the slides, and on the speaker's notes to ensure that each trainer will present the same comments and explanations.

Besides the work done on translation, Polish trainers had a good opportunity to interact with other TrainMiC international board members being presently at IRMM.

Members of the Polish TrainMiC Team (Trainers):

Danuta Barałkiewicz, Adam Mickiewicz University, Poznań
Ewa Bulska, Warsaw University
Ryszard Dobrowolski, Marie Curie-Skłodowska University, Lublin
Beata Godlewska-Żyłkiewicz, Białystok University
Ryszard Świetlik, Technical University of Radom



*B. Godlewska-Żyłkiewicz, R. Świetlik,
D. Barałkiewicz, R. Dobrowolski
at IRMM site*



*B. Godlewska-Żyłkiewicz and Ewa Bulska
during the translation*

The EU TrainMiC report in Polish language will be published by the end of 2005.

Training in metrology in chemistry for Western Balkan Countries

Maribor, 27-28 January 2005

Nineta Majcen



Presented TrainMiC modules: Introduction to metrology in chemistry, Measurement traceability, Validation of measurement procedure, Measurement uncertainty, Inter-laboratory comparisons, Reference materials, Applied statistics.

Participants from: Albania, Bosnia and Herzegovina, Croatia, Macedonia, Serbia and Montenegro, Slovenia

TrainMiC lecturers: Dr. Ljudmila Benedik (IJS/IRMM), Dr. Andreja Drolc (KI), Monika Inkret (IRMM), Assist.Prof.Dr. Nineta Majcen (MIRS/IRMM), Prof.Dr.Milenko Roš (KI), Dr.Philip Taylor (IRMM, project leader)



Organised by:

- EC-JRC DG, Institute for Reference Materials and Measurements (IRMM)
- University of Maribor, Faculty of Chemistry and Chemical Engineering (FKKT)
- Ministry of Higher Education, Science and Technology of the Republic of Slovenia, Metrology Institute (MIRS)

The 5th TrainMiC seminar in Romania
Steluta Duta

On **3-4 May 2005**, the 5th TrainMiC seminar that was dedicated to the practitioners was organised by IRMM and National Institute of Metrology (INM), in Romania. A total of 25 participants from governmental bodies, from metrology and from research institutes and chemical laboratories attended this course.

All the presentations were made by local authorised TrainMiC trainers as well as two practical sessions. For the first time, the first version of the complete TrainMiC textbook - translated in Romanian - was distributed to all participants.

This event offered also the opportunity to have a good interaction with representatives from environmental institutions, which expressed their interest to get some TrainMiC training dedicated to water laboratories.



TrainMiC seminar at INM, Bucharest, May 2005.

No. of participants:	25
Participants:	experts from research institutions and chemical laboratories
Timing:	2 days

Training in metrology in chemistry for experts analysing waste water samples
Nineta Majcen

Slovenian legislation regarding waste water monitoring requires laboratories to be accredited according to EN ISO 17025 for the parameters they are measuring within the scope of the monitoring. As one of the requirements of this international standard is participation in inter-laboratory comparisons, National Institute of Chemistry (KI) has started their organisation already several years ago, mainly for laboratories from Slovenia and neighbouring countries. Nowadays, about sixty laboratories participate in every round. Each inter-laboratory comparison ends with a workshop ('ILC workshop') where the results are presented and discussed, so the participants can easier apply corrective actions, where needed. As participation to inter-laboratory comparison is an important requirement of EN ISO 17025, lead and technical assessors of the Slovenian accreditation are always invited to attend this final event of the inter-laboratory comparison as well.

On **25 January 2005** it happened for the second time that such an ILC workshop was combined with the training course on metrology in chemistry (TrainMiC). TrainMiC is coordinated by the Institute for Reference Materials and Measurements (IRMM DG JRC - EC), while the Metrology Institute of the Republic of Slovenia (MIRS) is a national co-ordinator in Slovenia.

On this occasion, two TrainMiC modules were presented. After theoretical introduction to measurement traceability, which was given by Dr. Philip Taylor (IRMM), the participants were asked to work on one practical example, which was afterwards presented and discussed. As have been experienced before, several issues appeared to be understood in different way, some of them being crucial for obtaining comparable results.

The TrainMiC part of the workshop was concluded by the presentation on measurement uncertainty given by Dr. Andreja Drolc (KI) and the participants expressed their interest to work on practical examples in this topic too.



Practical exercise on measurement traceability, National Institute of Chemistry, Ljubljana, 2005.