International Union of Pure and Applied Chemistry
Analytical Chemistry Division

TEAMWORK

Issue 19, July 2017

Welcome to Teamwork 2017

Preparing the magazine since 2002, the Analytical Chemistry Division informs on its main activities and key products typically to the IUPAC General Assembly, and, also announces what the Analytical Chemists within IUPAC are doing and thinking about. Further information can be found on the IUPAC Analytical Chemistry Division website: https://iupac.org/who-we-are/divisions/division-details/?body_code=500

Professor Jan Labuda, President of the Division V

This issue includes:

DIVISION PRIORITIES, ACHIEVEMENTS AND PLANS

Jan Labuda

The Analytical Division of IUPAC continues to be active in the on-going revision of the Orange Book under the title "Compendium of Terminology in Analytical Chemistry" with Brynn Hibbert as the Editor, and the fields covered by the subcommittees such as critically-evaluated data, quality assurance and metrology in chemistry, and measurement of pH.

Division priorities and achievements

- Division Committee permanent activity covers particularly the transfer of information from the Secretariat and DP to the Div members as well as via mutual contacts of the Div officers, Committee members and representatives.
- Preparation of PAC Recommendations/ Technical Reports related to the Orange Book revision.
- Progress on individual IUPAC projects following their planned end dates.
- Participation of the Div reps on the work of other bodies, the Div members/projects chairs on workshops and conferences with information on IUPAC, projects dissemination, and the Div V goals and activities.
- Division ballot for the next biennium to ensure continuation in the active work.

Plans for this biennium and beyond

The overall strategy is directed to visibility of the Division and its subcommittees as well as quality of the Division products. It concerns:

a) Finalization of the revision of the Orange Book. At present, most of the chapters are in a reasonably advanced state when the chapters undergo through the PAC Recommendations/TRs publications, for details see below.
b) IUPAC projects selection on issues recognized as emerging ones:
   - Finalization of a quite long list of running projects, for details see below.
   - Selection of new projects within Analytical Chemistry and within the Subcommittee on Solubility and Equilibrium Data (SSED) – at present 3 project proposals under evaluation.
c) SSED and SpH activities and products, for details see below.
d) Work of the Div V reps in internal and external bodies.

Keeping the IUPAC Strategic Plan as "living document", particularly via:

- *A focus on those aspects of chemistry where global consensus is essential for progress in research, commerce and policy:*

This is performed via:

a) Longtime and intensive participation of the Div V on all modern aspects of the chemical measurement as stated by the International Vocabulary on Metrology (VIM). This participation covers activities of both Div V directly and external cooperation within JCGM with the WG1 and WG2, and others.
b) Intensive work the Orange Book re-edition and publication of PAC Recommendations on individual methods of the analytical chemistry.
c) Div V projects and projects with interdivisional cooperation and participation.

- *Respect for its objectivity and scientific excellence, providing access to the highest levels in the scientific, industrial, and policy communities to represent global chemistry:*

This continues to be performed by Div V representatives at internal and external bodies, interdivisional interaction and collaboration including chemistry education.

- *A worldwide base of volunteers with the best skills and background, recruited by transparent and well-understood processes:*

This continues to be performed by checking the projects task group composition considering skill and geographic representation of the members.

Actualization of the Division Web page

The Division Vice President Zoltán Mester has contributed significantly to the reconstruction the Division Web page which includes now main activities and documents from the last years.

SSED Web Page (*David Shaw*):

Over the last several months the SSED web page has been brought up to date and reorganized to better reflect the full range of the subcommittee's activities. Concise sections of the page now present our work in the following areas:

- Solubility Data Series with a full, current list of published volumes,
- Stability Constant Database,
- International Symposia on Solubility Phenomena with a list of all past symposia,
- The Franzosini Award with a complete list of recipients.

A schedule of future meetings is now current and minutes of all meetings from 2001 through 2016 are posted. We are currently working to revise our list of participants and ensure that all contact information is current. We are also considering other activities which might be added to the page.

Officers and Division meeting in Bratislava, Slovakia, on 19 to 21 March, 2016

Off-year (between General Assemblies) Division meeting was held in March 2016 at the Slovak University of Technology in Bratislava. Most of ACD Committee members have been present: Jan Labuda, Slovakia, D. Brynn Hibbert, Australia, Zoltan Mester, Canada, Attila Felinger, Hungary, Derek Craston, UK, Elena Savonina instead of Tatiana Maryutina, Russia, Takae Takeuchi, Japan, Sandra Rondinini, Italy, Heli M. M. Sirén, Finland, David G. Shaw, USA, M. Filomena Camões, Portugal, Paul De

Bièvre, Belgium, Érico M. M. Flores, Brazil, M. Clara F. Magalhães, Portugal, Slavica S. Ražić, Serbia, Aleš Fajgelj, Slovenia, Stefan Tsakovski, Bulgary, Earle Waghorne, Ireland, and Huan-Tsung Chang, China Taipei. They included several of the Past-Presidents of the ACD (D. Brynn Hibbert, M. Filomena Camões, and Aleš Fajgelj). We have had the oportunity to host in Bratislava also the long-year ACD member and representative to other bodies Professor Paul De Bièvre who passed away on 14 April 2016 in Leuven, Belgium.

During the meeting the organization of the Division with respect the IUPAC Strategic plan has been discussed and the ACD projects as well as the reports from our representatives to internal and external committees have been reviewed. There was a long discussion on the revision of the Orange Book, and the Workshop „Advances in Analytical Chemistry“ organized in Bratislava close after the ACD meeting on 21 March, 2016, Slovakia was discussed and planned in details.

Participants of the Division V meeting in Bratislava on 19 to 21 March, 2016. Left to right: Elena Savonina, Earle Waghorne, Takae Takeuchi, Aleš Fajgelj, Stefan Tsakovski, M. Filomena Camões, Attila Felinger, Zoltan Mester, Jan Labuda, D. Brynn Hibbert, Heli M. M. Sirén, Huan-Tsung Chang, Sandra Rondinini, Érico M. M. Flores, M. Clara F. Magalhães, David G. Shaw, Slavica S. Ražić, Paul De Bièvre, Derek Craston.

Membership of internal and external committees

The Division has concerns about the organizational structure for the appointment of IUPAC representative to outside bodies. At present there is no clear process to approve and fund these very important roles.

ACD members on internal and external committees:

Body/ Committee/ Organisation	**Membership**
Internal	
Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS)	Attila Felinger
Committee on Chemical Education (CCE)	Maria Filomena Camões
Committee on Chemical Industry (COCI)	Jan Labuda
Committee on Publications and Cheminformatics Data Standards (CPCDS)	Brynn Hibbert
Committee on Chemistry Research Funding (CCRF)	Jan Labuda
Pure and Applied Chemistry Editorial Advisory Board (PAC-EAB)	Zoltán Mester
External	
International Committee on Weights and Measures/Consultative Committee on the Amount of Substance (CIPM/CCQM)	Zoltán Mester
ISO-Committee on Reference Materials (ISO/REMCO)	Aleš Fajgelj
Joint Committee for Guides in Metrology (JCGM)	Zoltán Mester
Joint Committee for Guides in Metrology Working Group1 (JCGM WG1)	Steven Ellison, Juris Meija
Joint Committee for Guides in Metrology Working Group 2 (JCGM WG2)	Zoltán Mester, Gunnar Nordin
Inter-Agency Meeting (IAM)	Zoltán Mester
EUCHEMS	Slavica Razic, Jan Labuda
African Analytical Network	Nelson Torto
CITAC	Ilya Kuselman / Aleš Fajgelj
CODATA	M. Clara Magalhães / James Sangster
EURACHEM	M. F. Camoes

Report from the JCGM-WG1

Juris Meija (NRC), Stephen Ellison (LGC)

The Joint Committee for Guides in Metrology (JCGM) is tasked with maintaining and promoting the use of the "Guide to the Expression of Uncertainty in Measurement" (known as the GUM) and the "International Vocabulary of Metrology" (known as the VIM). The JCGM operates through two working groups: JCGM-WG1, with responsibility for the GUM, and JCGM-WG2, with responsibility for the VIM. JCGM has eight member organizations which include IUPAC. IUPAC is currently represented in the JCGM-WG1 by Stephen Ellison (LGC, UK) and Juris Meija (NRC, Canada).

The June 2016 meeting of WG1 focused primarily on two items of business; actions following member and NMI comment on the 2015 Committee

Draft of a revision of the GUM, and steps towards a further JCGM Supplement covering the construction of a 'measurement model' suitable for evaluation of measurement uncertainty. The working group acknowledges that the proposed GUM2 has failed to adequately communicate the rationale for revision of the GUM.

Cooperation with EuCheMS

Slavica Razic

Close cooperation of ACD with DAC-EuCheMS is important and recognized on both sides. In that sense, it is a good practice to exchange information on various activities between divisions and stimulate an exchange of knowledge in contemporary Analytical chemistry. All actions were at the highest level on the meeting in Bratislava (March 2016.) mentioned in the first part of this document.

Good communication between relevant individuals/parties will give good results in both practical and theoretical issues related to Analytical chemistry and organization of both divisions.

HOT TOPIC

Revision of the Orange Book

Brynn Hibbert

The new edition will be titled "Compendium of Terminology in Analytical Chemistry" and will be a vocabulary of concepts with definitions of terms that are compatible with the Gold Book. The revision of the Orange Book with twelve chapters being worked on by task groups, some backed by projects. It represents the main division activity and product during the biennium. A contract with the Royal Society of Chemistry last year, for a submission date of 31 March 2018, expectation 1000 pages (@500 words per page).

The present status of chapters of the OB is:

Chapter # and Title	Editor	State
1. Fundamental concepts and terms (metrology)	Heiner Korte	Draft completed with discussion still ongoing.
2. Chemometrics and statistics	Brynn Hibbert	Recommendation published. a)
3. Sampling and sample preparation	Janusz Pawliszyn	TR and Recommendation published b), c)
4. Methods of analysis depending on measurements of mass and volume	Maria F. Camões	TR submitted 27/4/2017.
5. Separation	Tatyana Maryutina	Revision submitted 24/4/2017.
6. Spectroscopic methods of analysis	Derek Craston	Suggestion to split into 3 chapters. No drafts as yet.
7. Mass spectrometry	Zoltán Mester	Recently published Recommendation. Chapter draft in Dropbox. d)

8. Electrochemi-cal methods of analysis	José M. Pingarrón	Draft being finalized by B. Hibbert and C. Brett.
9. Radioanalyti-cal methods	Peter Bode	Attempts to synthesize Chai and Bonardi texts.
10. Surface Analysis	Takae Takeuchi	Draft in preparation by new a team.
11. Thermal methods of analysis	Carlos Castro	
12. Bioanalytical methods	Jan Labuda	Accepted subject to final revision 26/4/2017.
13. Quality Assurance	Ulf Örnemark	Substantial draft in Dropbox. Close working with Chapter 1 team.

a) Hibbert, D. B., Vocabulary of concepts and terms in chemometrics (IUPAC Recommendations 2016). Pure Appl. Chem. **2016,** 88 (4), 407-443.

b) Poole, C.; Mester, Z.; Miró, M.; Pedersen-Bjergaard, S.; Pawliszyn, J., Extraction for analytical scale sample preparation (IUPAC Technical Report). Pure Appl. Chem. **2016,** 88 (7), 649-687.

c) Poole, C.; Mester, Z.; Miró, M.; Pedersen-Bjergaard, S.; Pawliszyn, J., Glossary of terms used in extraction (IUPAC Recommendations 2016). Pure Appl. Chem. **2016,** 88 (5), 517-558.

d Murray, K. K.; Boyd, R. K.; Eberlin, M. N.; Langley, G. J.; Li, L.; Naito, Y., Definitions of terms relating to mass spectrometry (IUPAC Recommendations 2013). Pure Appl. Chem. **2013,** 85 (7), 1515-1609.

It is expected that going through PAC recommendations will facilitate uptake into the new electronic Gold Book, http://www.iupac.org/project/2013-052-1-024.

REPORTS FROM THE SUBCOMMITTEES

SSED subcommittee activity report

M. Clara Magalhães, David Shaw

The **17th International Symposium on Solubility Phenomena and Related Equilibrium Processes** occurred in the University of Geneva, Geneva, Switzerland from the 25th to the 29th July 2016. The conference was attended by around 110 people, and had 13 plenary lectures, 40 oral communications and 38 posters. This IUPAC sponsored symposium included the Workshop on "Solubility in energy and waste issues of emerging concern" under the responsibility of a IUPAC Task Group, and the Workshop "Technology – critical elements prone to hydrolysis in biological and environmental systems" under the responsibility of the COST TD1470 workshop. Three IUPAC prizes, for the best poster communications, were given.

The 2016 Franzosini Award was given to David Fellhauer in recognition of his contribution to the IUPAC Solubility Data Project. He was honored at the 15th Annual Meeting of the IUPAC Subcommittee on Solubility and Equilibrium Data held in Geneva, Switzerland on the 24 July 2016 and which took place during the 17th International

Symposium on Solubility Phenomena and Related Equilibrium Processes.

The 42nd Annual Meeting of the former Solubility Committee and 15th of the SSED was held in conjunction with the 17th ISSP on the 24th July 2016 in Geneva, Switzerland. This meeting was attended by 22 members of SSED.

Subcommittee on pH (SpH) report

M. F. Camoes

In the frame of the activities and plans of SpH: Traceability of pH Measurements for Application in Fundamental and Applied Science, the milestones of ongoing Project Nº 2013-013-1-500- pH Measurement in Seawater (M F Camões chair) were presented, starting from IUPAC Recommendations 2002: Measurement of pH. Definition, Standards, and Procedures. An account of publications, further research, and collaboration with relevant stakeholders is given. In 2016, the contribution "Metrological challenges for measurements of key climatological observables. Part 3: Seawater pH" has been published as the product to Global climate changes.

PUBLICATIONS

IUPAC Recommendations and Technical Reports published in Pure and Applied Chemistry

Hibbert, D. B.,
Vocabulary of concepts and terms in chemometrics (IUPAC Recommendations 2016)
Pure Appl. Chem. 2016, **88**(4), 407-443.

Poole, C.; Mester, Z.; Miró, M.; Pedersen-Bjergaard, S.; Pawliszyn, J.,
Glossary of terms used in extraction (IUPAC Recommendations 2016)
Pure Appl. Chem. 2016, **88**(5), 517-558.

Poole, C.; Mester, Z.; Miró, M.; Pedersen-Bjergaard, S.; Pawliszyn, J.,
Extraction for analytical scale sample preparation (IUPAC Technical Report)
Pure Appl. Chem. 2016, **88** (7), 649-687.

Labuda, J.; Bowater, R.P.; Fojta, M.; Gauglitz, G.; Glatz, Z.; Hapala, I.; Havliš, J.; Kilar, F.; Kilar, A.; Malinovská, L.; Sirén, H.M.M.; Skládal, P.; Torta, F.; Valachovič, M.; Wimmerová, M.; Zdráhal, Z.; Hibbert, D.B.
Terminology of bioanalytical methods (IUPAC Recommendations 201x)
Pure Appl. Chem. Accepted subject to final revision 26/4/2017.

Articles in Chemistry International

IUPAC Wire – Solubility Data Series Books now Available on Web,
Chem. Interntl. 2015, **37** (5-6), 27.

IUPAC Wire – Christo Balarew receives Presidential Honors,
Chem Internatl. 2015, **35** (5-6), 28-29.

Making an imPACT – International Vocabulary of Metrology,
Chem. Internatl. 2016, **38** (1), 25.

Pawliszyn, J. IUPAC Provisional Recommendations – Glossary of Terms Used in Extraction, Chem Internatl., 2015, **37**(5-6), 38; 2016, **38** (1), 26.

Hibbert, D. B. IUPAC Provisional Recommendations – Vocabulary of Concepts and Terms in Chemometrics, Chem Internatl., 2016, **38** (1), 27.

Where 2B & Y – Solubility Phenomena, Chem Internatl. 2016, **38** (2), 32.

Mark Your Calendar – International Symposium in Solubility Phenomena and Related Equilibrium Processes, Chem Internatl. 2015, **37** (5-6), 49; 2016, **38** (1), 41; **38** (2), 36; **38** (3-4), 52.

IUPAC Wire – In Memoriam Paul de Bièvre, Chem.Internatl. 2016, **38** (5), 22-23.

Project Place - Critical Evaluation of Equilibrium Constants of 4f Metal Mixed Complexes with Acidic (Chelating) Ligands in Combination with Various Organophosphorus O-donor Molecules Chem. Internatl. 2016, **38** (5), 24.

Kuselman, I.; Pennecchi, F. Human Errors in a Routine Analytical Laboratory—Classification, Modeling and Quantification: Overview of the IUPAC/CITAC Guide, Chem. Internatl. 2016, **38** (5), 27-30.

Sangster, J. WANTED: A Home for an Orphaned Chemical database, Chem. Internatl. 2016, **38** (6), 21.

Hibbert, D. B. Making an ImPACT - Vocabulary of Concepts and Terms in Chemometrics (IUPAC Recommendations 2016), Chem. Internatl. 2016, **38** (6), 26.

Poole, C.; Mester, Z.; Miró, M.; Pedersen-Bjergaard, S.; Pawliszyn, J. Making an imPACT – Glossary of Terms Used in Extraction (IUPAC Recommendations 2016), Chem. Internatl. 2016, **38** (6), 26.

Poole, C.; Mester, Z.; Miró, M.; Pedersen-Bjergaard, S.; Pawliszyn, J. Making an imPACT – Extraction for Analytical Scale Sample Preparation (IUPAC Technical Report), Chem. Internatl. 2016, **38** (6), 26.

IUPAC Wire – Remembering Peter Greaves Taylor Fogg (1929-2016), Chem. Internatl. 2017, **39** (1), 22-23.

Labuda, J. IUPAC Provisional Recommendations – Terminology of Bioanalytical Methods Chem. Internatl. 2017, **39** (1), 30.

Articles in other journals

Dickson, AG.; Camoes, MF.; Spitzer, P.; Fisicaro, P.; Stoica, D.; Pawlowicz, R.; Feistel, R., Metrological challenges for measurements of key climatological observables. Part 3: Seawater pH. Metrologia 2016, **53**, R26-R39.

Oracz, P., Góral M., Wišniewska-Goclowska B., Shaw DG., Maczyński A., IUPAC-NIST Solubility Data Series. 101. Alcohol + Hydrocarbons + Water. Part 2. C_1-C_3 Alcohols + Aliphatic Hydrocarbons, J. Phys. Chem. Ref. Data 2016, **45**, 033102

Oracz, P., Góral M., Wišniewska-Goclowska B., Shaw DG., Maczyński A., IUPAC-NIST Solubility Data Series. 101. Alcohol + Hydrocarbons + Water. Part 3. C_1-C_3 Alcohols + Aromatic Hydrocarbons, J. Phys. Chem. Ref. Data 2016, **45**, 033103

PROJECTS COVERED BY THE DIVISION

Recently completed projects

Within last two years, six projects have been completed:

2014-027-1-500 IUPAC/CITAC guide for classification, modeling and quantifictation of human errors in a chemical analytical laboratory (Kuselman)

2014-012-2-500 Solubility data series – Celebrating 100 volumes of plenitude of the IUPAC-NIST SERIES (Magalhães)

2013-015-1-500 Methods to evaluate the scavenging activity of antioxidants towards reactive oxygen and nitrogen species (ROS/RNS) (Apak)

2011-063-1-500 Sampling and sampling preparation - Revision of the ORANGE BOOK CHAPTER 2 (Pawliszyn)

2010-061-2-500 Using process mapping to support (analytical) laboratory process (Malek)

2003-015-2-500 Terminology, quantities and units concerning production and applications of radionuclides in radiopharmaceutical and radioanalytical chemistry (Bonardi)

Running projects

The Division has about 32 running projects, 3 projects covered by several division, and 2 special projects. They include those that belong to the Subcommittee on Solubility and Equilibrium Data, the Subcommittee on pH, and the Interdivisional Working Party for Harmonization of Quality Assurance and interdivisional projects:

2017-005-3-500 Analytical chemistry of nanomaterials -- critical evaluation (Labuda)

2016-043-1-500 Interdivisional Discussion of Critical Evaluation of Chemical Data (Shaw)

2016-007-1-500 Risks of conformity assessment of a multicomponent material or object in relation to measurement uncertainty of its test results (Kuselman)

2016-005-1-500 Calcium sulfate in water (Nordstrom)

2016-004-1-500 Solubility in energy and waste issues of emerging concern (Filella)

2016-003-1-500 Critical evaluation of equilibrium constants of 4f-metal mixed complexes with acidic chelate and organophosphorus O-donor ligands (Atanassova)

2015-051-1-500 Solubility of Alkaline Earth Metal Chlorides in Water (Voigt)

2015-044-2-500 Critical evaluation of data on solubility and liquid-liquid equilibria in binary mixtures of 1-alkyl-3-methylimidazolium based ionic liquid and molecular solvent (Bendova)

2015-028-2-500 Methods of analysis depending on measurement of mass and volume - Revision of the Orange book CHAPTER 3 (Camoes)

2015-024-2-500 Metrology and Measurement Uncertainty Brochure (Hibbert)

2015-021-1-500 Supplement to project titled revision of the IUPAC orange book (project #2012-005-1-500) (Hibbert)

2015-020-2-500 Critical compilation of acid pKa values in polar aprotic solvents (Leito)

2015-008-2-500 Critical Evaluation and Vocabulary of Chemo-sensing and Determination Methods for Explosive Residues On-Site and in the Field (Apak)

2014-025-1-500 Revision of the Orange Book, Chapters 1 and 1a (De Bièvre, Hibbert)

2013-034-1-500 Mutual Solubility of Rare Earth Metal (Sc, Y, Lanthanides) Bromides in Molten Alkali Bromides (Gaune-Escard)

2013-025-2-500 Methods for the SI Value Assignment of the Purity of Organic Compounds for use as Primary Reference Materials and Calibrators (Westwood)

2013-013-1-500 pH Measurement in Seawater (Camoes)

2012-031-1-500 Modernizing the website of the Subcommittee on Solubility and Equilibrium Data (Shaw)

2012-030-1-500 Rare Earth Metal (Sc, Y, Lanthanoids) Fluorides in Water and Aqueous Systems (Guminski)

2012-022-1-500 Solubility in Systems with Lithium and/or Sodium Nitrates Part 2 - Sodium Nitrates (Eysseltova)

2012-008-1-500 Critical Evaluation of Thermodynamic Data of Sulfate Complexes in Solution (Hefter)

2012-004-1-500 Solubility of lead carbonates (Gamsjager)

2011-065-3-500 Database on liquid-liquid equilibria of binary mixtures of (ionic liquids and molecular compounds) (Bendova)

2011-047-1-500 Recent advances in bioanalytical chemistry: characterization and classification - Revision to the Orange Book CHAPTER 11 (Labuda)

2011-046-1-500 Separation - Revision of the Orange Book CHAPTER 4 (Maryutina)

2011-031-1-500 Solubility of Lithium Sulfate in Aqueous Solutions (Voigt)

2010-052-1-500 Electroanalytical Chemistry - The Revision of the Orange Book CHAPTER 7 (Pingarron)

2009-006-1-500 Experimental Requirements for Single-Laboratory Validation (Ellison)

2008-025-1-500 Humic-metal binding constants database (Filella)

2005-035-2-500 Trace elements analysis: role of grain size distribution in solid reference materials (Belli)

2002-044-1-500 Solubility data related to industrial processes. Carbon dioxide in aqueous non-electrolyte solutions (Scharlin)

2001-063-1-500 Revision of terminology of separation science (Smith)

New projects

Proposals submitted for evaluation:
2016-041-1 Critical evaluation of homogeneous equilibrium and solubility constants of pentavalent technology-critical elements (Nb, Ta, Sb) in environmental and biological-relevant condition (Filella, SSED)

2016-042-1 Critical evaluation of homogeneous equilibrium and solubility constants of tellurium in environmental and biological-relevant conditions (Filella, SSED)

MEETING REPORT

Workshop "Advances in Analytical Chemistry" in Bratislava on 21 March, 2016.

Jan Labuda

The aim of the workshop was to provide state-of-the-art of specific topics of modern Analytical Chemistry, its concepts and associated terms together with identification of its future tasks, as well as to share experiences of scientists and researchers in different areas of analytical chemical measurement at universities and research laboratories. The workshop was also a way for the education particularly university teachers, research staff and young chemists - coworkers and students from universities in Slovakia and institutes of the Slovak Academy of Sciences.

Programm of the workshop:

9.00 Opening
9.10 *Zoltán* Mester *(Canada):* Redefinition of the SI Units of Measurements
9.45 *Érico M. M. Flores (Brasil):* New Developments in Sample Preparation for Trace Elements Determination
10.20 *Tatiana Maryutina (Russia):* Element Analysis of Oil
10.55 *M. Clara F. Magalhães (Portugal):* Arsenic in the Environment - New Paradigms, New Challenges
11.30 *Slavica S. Ražić (Serbia):* Analytical Chalenges in Biogenic Volatile Organic Compounds
12.05 *Paul De Bièvre (Belgium):* The Annotations on the 2008 VIM 3 and the Progress in Matters of the 2018 VIM 4
13.30 *D. Brynn Hibbert (Australia):* Forensic Analytical Chemistry - Murders, Doped Racehorses and Drugs
14.05 *Attila Felinger (Hungary):* The Latest Developments in Liquid Chromatography Stationary Phases
14.40 *Jan Labuda (Slovakia):* Analytical Chemistry of Nanomaterials and Nanomaterials in Analytical Chemistry

15.15 Lab-tour Visit at the Institute of Analytical Chemistry of the STU

16.00 General Discussion and Closing

Lecture by Professor D. Brynn Hibbert

Lecture by Professor De Bièvre

Lecture by Professor Érico Flores

Lecture by Professor Slavica Ražić

Lab-tour Visit at the Institute of Analytical Chemistry

Lecture by Dr. Zoltán Mester

MEMBERSHIP OF THE ACD (2016 – 2017)

Officers	
President of the Division	Jan Labuda
Vice President	Zoltán Mester
Secretary	Attila Felinger
Past President	Brynn Hibbert
Titular Members	Derek Craston
	Tatyana Maryutina
	Sandra Rondinini
	David G. Shaw
	Heli M. M. Sirén
	Takae Takeuchi
Associate Members	Maria Filomena Camões
	Érico M. M. Flores
	Hasuck Kim
	M. Clara Magalhães
	Slavica S. Ražić
National Representatives	Medhat A. Al-Ghobashy
	Resat Apak
	Muhammad Makshoof Athar
	Huan-Tsung Chang
	Ales Fajgelj
	Wandee Luesaiwong
	Stefan Tsakovski
	Lea Sibulelo Vilakazi
	Earle Waghorne