EuCheMS
European Chemical Sciences

Serbian Chemical Society

University of Belgrade
Faculty of Chemistry

7th EuroVariety

European Variety in University Chemistry Education

BOOK OF ABSTRACTS

University Chemistry Education for the Challenges of Contemporary Society

Belgrade, 28 – 30 June 2017

Published by
Serbian Chemical Society
Karnegijeva 4/III, 11000 Belgrade, Serbia

For Publisher,
Živoslav Tešić

Edited by
Dragica Trivic
University of Belgrade – Faculty of Chemistry

Proofreading by
Jasmina Arsenijevic Mijalkovic
University of Belgrade – Faculty of Chemistry

Circulation
150 Copy Printing

ISBN 978-86-7132-065-8

Printing
R&D center of printing engineering, the University of Belgrade – Faculty of Technology and Metallurgy, Karnegijeva 4, Belgrade, Serbia

CIP- Каталогизација у публикацији
Народна библиотека Србије

371.3::54(048)

EUROVARIETY European Variety in University Chemistry Education (7 ; 2017 ; Beograd)
University Chemistry Education for the Challenges of Contemporary Society : book of abstracts / 7th EuroVariety - European Variety in University Chemistry Education, Belgrade, 28-30 June 2017 ; [organized by] EUCheMS Division of Chemical Education, Serbian Chemical Society [and] Faculty of Chemistry ; [edited by Dragica Trivic]. - Belgrade : Serbian Chemical Society, 2017 (Belgrade : R&D Center of Printing Engineering). - 147 str. ; 25 cm

Tiraž 150. - Bibliografija uz većinu radova. - Registar.

ISBN 978-86-7132-065-8

1. EUCheMS Division of Chemical Education (Belgrade) 2. Serbian Chemical Society (Belgrade) 3. Faculty of Chemistry (Belgrade)

a) Хемија - Високошколска настава - Апстракти

COBISS.SR-ID 237903372

PREFACE

The conference entitled 7th EuroVariety – European Variety in University Chemistry Education has been organized by the University of Belgrade – the Faculty of Chemistry, the Serbian Chemical Society and the EUCheMS Division of Chemical Education. The main aim of the Conference is to provide an opportunity to share knowledge and experience relating to the important issues concerning university chemistry and chemical technology education in order to prepare future students to better respond to their personal needs and the needs of the contemporary society and to meet the labour market requirements. Therefore, the conference theme "**University Chemistry Education for the Challenges of Contemporary Society**" points out the need for continuous reconsideration of the connections between BSc, MSc and PhD chemistry studies and the contemporary professional, social and scientific challenges.

Over 70 participants from 29 countries have shared their experiences in their presentations offering their insights, pointing up the challenges and suggesting new solutions regarding the following Conference topics:

- Development of the university curricula for BSc, MSc and PhD chemistry studies
- Competency-based university chemistry education
- Chemistry education through university-industry partnerships
- Laboratory work as an element of problem solving and inquiry-based chemistry education
- Ethical guidelines and university chemistry education for sustainable development
- The use of ICT in chemistry education at the 3rd level
- The role of history of chemistry and philosophy of science in university education
- Cultural heritage and chemistry education
- Development of educational competencies of academic chemistry teachers
- Evaluation of learning outcomes and problems relating to assessment in HEIs
- The contemporary chemistry teachers' education and the long-term professional development of chemistry teachers.

Summaries in this Book of Abstracts deal with the practical aspects of teaching chemistry and research into chemistry education at both undergraduate and postgraduate levels with the aim of enabling students to build key professional and transferable skills needed in order to be successful in a highly competitive labour market and life in the rapidly changing world.

I wish all participants a successful conference and fruitful discussion. I hope you will all enjoy your stay in Belgrade.

Dragica Trivic

Head of the Local Organizing Committee

INTERNATIONAL SCIENTIFIC COMMITTEE

- **Antonella Rossi** (Italy)
- **Aureli Caamaño Ros** (Spain)
- **Bill Byers** (UK)
- **Carla Morais** (Portugal)
- **Dragica Trivić** (Serbia)
- **Fina Guitart** (Spain)
- **Georgios Tsaparlis** (Greece)
- **Hana Ctrnáctová** (Czech Republic)
- **Ilka Parchmann** (Germany)
- **Iwona Maciejowska** (Poland)
- **Iztok Devetak** (Slovenia)
- **Jan Apotheker** (Netherlands)
- **Jan Reguli** (Slovakia)
- **Jens Josephsen**(Denmark)
- **Karolina Broman**(Sweden)
- **Katherine Haxton** (UK)
- **Lemonia Antonoglou** (Greece)
- **Liberato Cardellini** (Italy)
- **Luca Szalay** (Hungary)
- **Mariann Holmberg** (Finland)
- **May Britt Stjerna** (Norway)
- **Mauro Mocerino** (Australia)
- **Miia Rannikmäe** (Estonia)
- **Mustafa Sözbilir** (Turkey)
- **Nenad Judas** (Croatia)
- **Susanne Wiedmer** (Finland)
- **Odilla Finlayson** (Ireland)
- **Pascal Mimero** (France)
- **Peter Childs** (Ireland)
- **Pita Vandevelde** (Belgium)
- **Rachel Mamlok Naaman** (Israel)
- **Reiner Salzer** (Germany)
- **Ron Blonder** (Israel)
- **Svetomir Hadži Jordanov** (Macedonia)
- **Uri Zoller** (Israel)
- **Zoltan Toth** (Hungary)

LOCAL ORGANISING COMMITEE

- **Dragica Trivić**, University of Belgrade - Faculty of Chemistry
  Head of the Local Organizing Committee
- **Živoslav Tešić**, Vice-Rector of the University of Belgrade
- **Ivanka Popović**, Vice-Rector of the University of Belgrade
- **Tatjana Verbić**, Vice-Dean for Teaching, University of Belgrade - Faculty of Chemistry
- **Radivoje Prodanović**, Vice-Dean for Finances, University of Belgrade - Faculty of Chemistry
- **Rada Baošić**, University of Belgrade - Faculty of Chemistry
- **Melina Kalagasidis Krušić**, University of Belgrade - The Faculty of Technology and Metallurgy
- **Igor Opsenica**, University of Belgrade - Faculty of Chemistry
- **Biljana Tomašević**, University of Belgrade - Faculty of Chemistry
- **Aleksandar Lolić**, University of Belgrade - Faculty of Chemistry
- **Natalija Polović**, University of Belgrade - Faculty of Chemistry
- **Dušica Milenković**, University of Novi Sad - Faculty of Sciences
- **Tamara Hrin**, University of Novi Sad - Faculty of Sciences
- **Vesna Milanović**, University of Belgrade - Faculty of Chemistry
- **Katarina Putica**, University of Belgrade - Innovation Center of the Faculty of Chemistry
- **Jasmina Arsenijević Mijalković**, University of Belgrade - Faculty of Chemistry
- **Srdjan Pokorni**, University of Belgrade - Faculty of Chemistry
- **Aleksandar Djordjević**, University of Belgrade - Faculty of Chemistry

7th EuroVariety - European Variety in University Chemistry Education is supported by

The Ministry of Education, Science and Technological Development of the Republic of Serbia

BASF

The Royal Society of Chemistry

PP-17

HISTORY OF CHEMISTRY IN THE PRE-SERVICE CHEMISTRY TEACHERS EDUCATION

Dragica D. Trivic[1] and Vesna D. Milanovic[1]

[1]University of Belgrade – Faculty of Chemistry, Studentski trg 12-16, Belgrade, Serbia
dtrivic@chem.bg.ac.rs; vesnamilanovic@chem.bg.ac.rs

History of chemistry could be an important part of the curriculum for pre-service chemistry teachers' education. This allows them the deeper understanding of nature of science and scientific work, as well as to build a base for future planning the contextual approaches through which their school students could learn about nature of science. History of Chemistry is taught in the fourth year within the integrated academic studies curriculum (300 ECTS) for chemistry teachers' education at the Faculty of Chemistry University of Belgrade.

During the last three school years at the very beginning of the course of History of Chemistry the estimation of the knowledge of some historical facts, such as the scientific contribution of Robert Boyle, Henry Cavendish, Joseph Priestley, Antoine Lavoisier, John Dalton, Jöns Jacob Berzelius, Alessandro Volta, Michael Faraday was conducted. These scientists were chosen according to the previous analysis of the syllabuses of different secondary school and university chemistry and physics subjects. In this way, we were able to examine whether students pay attention to the work of scientists when they study various subjects from chemistry and physics domain. In addition, we asked the students whether they read texts from the history of science, what was the most important scientific discovery from their point of view, who was the most significant scientist in their opinion, whether they had a role model among scientists. Also, we asked students to describe an experiment that they knew from the history of science.

The obtained results showed that students, future chemistry teachers, have developed certain attitudes about chemistry as a science, but they possess little knowledge about the scientific work of scientists. These findings are later useful for the lessons and workshops planning within the course of history of chemistry.

Keywords: History of chemistry, Chemistry teacher education, Scientists

Acknowledgement: This presentation is the result of work on the project "The Theory and Practice of Science in Society: Multidisciplinary, Educational and Intergenerational Perspectives", No. 179048, the realization of which is financed by

the Ministry of Education, Science and Technological Development of the Republic of Serbia.