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MODERN ANALYTICAL TECHNIQUES IN ELECTROCHEMISTRY: INTERNATIONAL SCHOOL IN CHANGCHUN

Simona Baluchová

Charles University, Faculty of Science, Department of Analytical Chemistry, UNESCO Laboratory of Environmental Electrochemistry, Albertov 6, 128 00 Prague 2, Czech Republic
simona.baluchova@natur.cuni.cz

In 2025, I had the opportunity to participate in *the "International Training School on Hyphenated Techniques for Electrochemical Interface Study for Countries along the Belt and Road & Developing Countries"*, organised by the Changchun Institute of Applied Chemistry (CIAC; Fig. 1, english.ciac.cas.cn), Chinese Academy of Sciences (CAS; http://english.cas.cn/). The main organisers of this event were Prof. Guobao Xu[1] and Assoc. Prof. Baohua Lou[2] from *the State Key Laboratory of Electroanalytical Chemistry*[3]. This was the third training school, which took place from 12 to 27 August 2025 and brought together a total of 25 young academics from 16 countries in Africa, Europe, the Middle East and Southeast Asia and a few guest participants (Fig. 1).

As part of this event, I first attended two international conferences organised by CIAC, namely *the 20th International Symposium on Electroanalytical Chemistry* (ISEAC) and *the 40th ISE Topical Meeting*. During these conferences, I presented the results of my research work in the form of two oral presentations and one poster presentation, which was awarded the *Best Poster Award*. The conferences provided a valuable space for professional discussions with the international electrochemical community and also allowed for a deeper insight into the current research directions of Chinese laboratories in the field of electrochemistry, thus contributing to the establishment of initial contacts for possible future cooperation.

The conference was immediately followed by the international school programme, which was very intensive and extremely beneficial from both a professional and cultural point of view. The professional programme included lectures by leading Chinese specialists focusing on modern "hyphenated techniques" for studying electrochemical interfaces, supplemented by laboratory excursions at the CIAC premises. Speakers included Prof. Guobao Xu, who focused on electrochemically generated chemiluminescence, Academician Prof. Erkang Wang[4] with an overview of the development of analytical sciences and their role in technological progress, and Prof.

Fig. 1. **(left) Changchun Institute of Applied Chemistry (CIAC). (right) Group photo of participants and organisers of the international school taken during the trip**

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Fig. 2. **(top) Participants of the international school with certificates. (bottom) Certificate awarded to Dr Baluchová**

Min Zhou[5], who presented data-driven approaches to the discovery of high-entropy alloy electrochemical catalysts and gave participants a glimpse into his research background. Other lectures focused, among other things, on the kinetics of electrochemical reactions at the level of individual molecules (Prof. Weilin Xu[6]) and the precise synthesis of noble metal nanocrystals and their surface and interfacial chemistry (Prof. Wenxin Niu[7]).

The programme was further enriched by the following lectures by leading experts from other prominent Chinese institutions: Prof. Wenbin Cai[8] from Fudan University (development and application of electrochemical surface-enhanced infrared absorption spectroscopy), Prof. Lin Gu[9] from Tsinghua University (advanced electron microscopy techniques for studying structures and electron properties at the atomic level), Prof. Zhangquan Peng[10] from the Dalian Institute of Chemical Physics (porous electrodes and electrolytes for batteries), and Prof. Bin Ren[11] from Xiamen University (methods of electrochemical surface-enhanced Raman spectroscopy).

Thanks to these activities, I gained a comprehensive overview of modern analytical approaches that combine electrochemistry with spectroscopic and microscopic methods and their use in the study of electrochemical interfaces. The international school programme concluded with a ceremonial presentation of certificates to the participants (Fig. 2).

In addition to the professional programme, we also had the opportunity to learn about the cultural heritage of

Jilin Province, including visits to the provincial museum, the former imperial palace and South Lake Park, and to discover the diversity of the local cuisine.

In conclusion, participation in this school was very beneficial from both a professional and personal point of view, as it enabled the emergence of new research ideas and the establishment of international contacts, which can be expected to develop further in the form of specific collaborations with other participants, scientists from CIAC and other Chinese research institutions. If another edition of this international school is organised, participation can be unequivocally recommended to young researchers, as the programme offers not only high-quality professional content, but also an exceptional opportunity to gain a broader perspective on current developments in electrochemistry and related analytical disciplines.

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