



## EDITORIAL

At the end of EIS 95, the final act as a Chairman of the Organizing Committee, is the publishing of the oral contributions to the Third International Symposium on Electrochemical Impedance Spectroscopy, held in Ysermonde (Belgium) from 7 to 12 May 1995.

After the first and the second editions of this symposium, which took place in Bombannes, France in 1989 (Chairman C. Gabrielli) and Santa Barbara, USA in 1992 (Chairman D. D. MacDonald) the question was: "Is it opportune to organize every three years a symposium about one very specific experimental electrochemical technique EIS? Are there developments and new results enough to justify a programme of one week?"

The number and the quality of the oral contributions and posters presented in Ysermonde can attest that EIS is now one of the important experimental methods in electrochemistry. The popularity of the technique is due to the fact that it is not only a powerful approach to determine reaction mechanisms but also to characterize and to monitor electrochemical processes (surface treatments, batteries and fuel cells, corrosion, transport through a membrane, electrochemical sensors, ...).

When an electrochemical reaction occurs several successive elementary phenomena or steps take place which are more or less strongly coupled: transport of reacting species from the bulk of the electrolyte towards the electrode, chemical reaction, adsorption of the reacting species or of not active species, charge transfer. The electrochemist wants to investigate fundamentally the mechanism of these reactions in order to determine the rate determining step and the kinetic parameters and also to identify the reaction or intermediate products. EIS performed in a broad frequency range allows us to determine the relaxation constants of the different elementary steps. On the other hand, when the electrochemical system is understood EIS is a powerful technique to monitor characteristics of the process (for example, state of charge of a battery, sealing grade of anodized aluminium, corrosion rate, transport of ions through a membrane, ...).

It is also important to note that other impedance spectroscopy methods, involving non-electrical characteristics have recently been introduced (electro gravimetric, electro optical, electro coulometric, electro hydrodynamic impedance spectroscopy).

If all the laboratories investigating electrochemical processes must now be equipped with, EIS it cannot be underlined enough that electrochemical "systems" cannot be understood or characterized only with one experimental technique. Other electrochemical but also complementary surface analytical methods (*ex situ* such as SEM, SAM, XPS, SIMS and *in situ* such as ellipsometry, Raman, IR, AFM, STM) must also be used for that purpose.

As a chairman of the Organizing Committee of the Third EIS Symposium, I would like to take this opportunity to express my gratitude to the members of this committee (G. Goeminne, A. Hubin, H. Terryn and S. Vandeputte) for the success of this meeting, and more particularly my most sincere thanks to my secretary L. Van Den Bossche for providing important and efficient assistance.

I sincerely hope that the next meeting organized in Brazil in 1998 by O. Mattos will be even more successful.

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