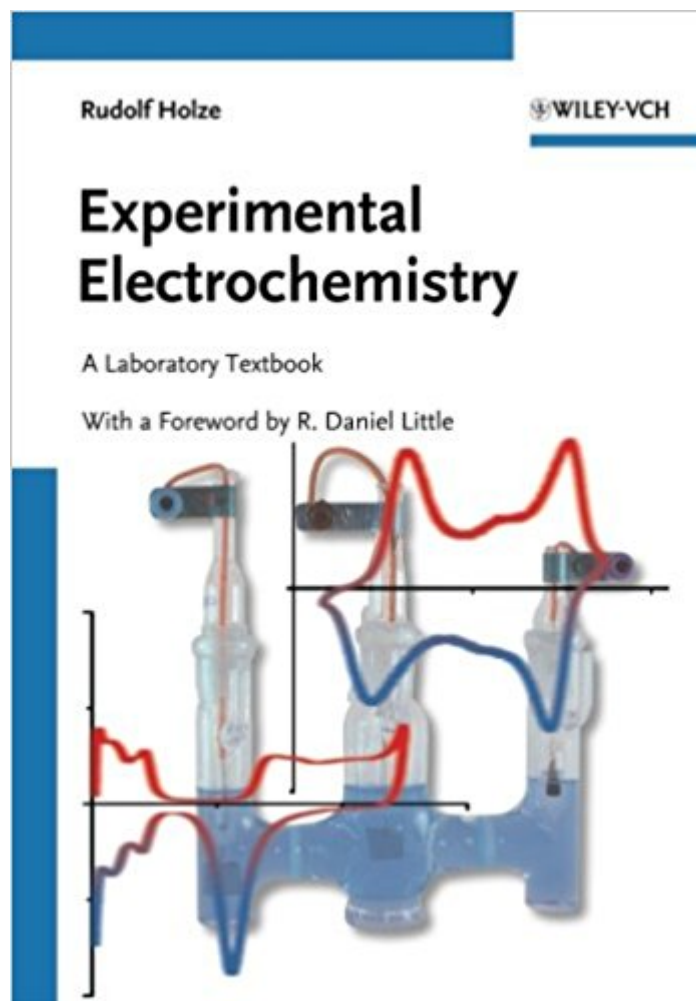


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# Experimental Electrochemistry



## Synopsis

The only comprehensive collection of easy-to-perform electrochemical experiments for both high school lessons and university lab courses. It illustrates the broad area of electrochemistry with respect to thematic aspects and apparatus used in the experiments. In addition, it highlights the interdisciplinary connections to related fields. Following a brief overview, the book goes on to deal with electrochemistry at equilibrium and with flowing current, while further chapters cover analytical electrochemistry, non-traditional methods, electrochemical energy storage and conversion as well as technical electrochemistry. Throughout, the author clearly describes every detail of the experiments and gives helpful guidance for the production of rare working materials. Complementing textbooks on electrochemistry, this is a must for lecturers as well as for students in chemistry.

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## Customer Reviews

Electrochemistry is part of our daily life: It powers our cell phones, notebook computers and many other electronic devices. It provides the power to start our cars in the morning, it is undesirably present in corrosion, but also needed in metal winning and refining. The list is seemingly endless. Similarly, electrochemical processes, methods, models, and concepts are present in numerous fields of science and technology. Electrochemistry as a subject is an extremely interdisciplinary science, and, being an experimental science, it demands the direct hands-on testing of a model or a theory. This textbook fills the gap for a wide-ranging collection of reproducible experiments suitable

for course work at all levels, from high school to university. The careful selection presented here is based on experiments developed and installed as part of laboratory courses for students of chemistry and materials science, as well as other sciences. In addition it contains experiments developed for teachers at the various levels where pupils will encounter electrochemistry for the first time. Following a brief overview, the book goes on to deal with electrochemistry at equilibrium and with flowing current, while further chapters cover analytical electrochemistry, non-traditional methods, electrochemical energy storage and conversion, as well as technical electrochemistry. Throughout, the author presents the obvious relationship between theory and experiment, while highlighting the practical importance of the experiments in our daily lives. The scope of electrochemistry is not only illustrated by the diversity of methods and concepts, it is also demonstrated by the range of instruments and tools employed. In all the descriptions the emphasis is placed on clear, well-defined, and lucid descriptions, including everything needed for a successful repetition of the experiment, while avoiding unnecessary details. If necessary, further references to textbooks, review articles, and research papers are given. Complementing textbooks on electrochemistry, this is a must for lecturers as well as for students in chemistry and related fields.

Rudolf Holze studied chemistry at the University of Bonn, Germany. He received his PhD for his work on components for electrochemical energy converting and storage systems. After that he went to the Case Western Reserve University, Cleveland, USA and dedicated himself to investigating the structure and dynamics of electrochemical double layer using spectroscopical methods. In 1987 Holze moved to the University of Oldenburg, Germany where he became professor in physical chemistry in 1989. Currently Rudolf Holze is professor at the Technical University of Chemnitz, Germany where his research is focused on structure and dynamics at electrified interfaces with emphasis on the development of experimental methods and the application of our know-how on problems of technological importance. He is author of numerous publications and several books.

It's almost impossible to find a laboratory textbook in electrochemistry written after 1920, and since then so many things have changed you might need an emeritus chemist to translate it for you (that's why I start by giving this book PLUS TWO STARS). Also, for general chemistry electrochemical experiments are pretty easy to find, but that's not the case with other basic courses like organic, inorganic and physical chemistry. In the case of physical chemistry Shoemaker (Experiments in Physical Chemistry), Matthews (Experimental Physical Chemistry) and Athawale (Experimental Physical Chemistry) include some classical nice experiments, but they're just not enough and most

of them emphasize the basic science aspects alone. In this book Holze manages to squeeze laboratory experiments for elementary, basic and intermediate (PLUS ONE STAR) electrochemistry, electroanalysis and electrosynthesis (PLUS TWO STARS) and in some of them also includes the applied science aspect of the experiment like corrosion and batteries (PLUS ONE STAR). You should really take a look at the table of contents. The MINUS ONE STAR comes from the book's lack of equipment diagrams and detailed instructions. It's more a guide for the instructors than a real laboratory textbook. Also, the book leaves behind all the possibilities of amalgam electrodes (and yes, the environmental issue can be a problem if your ignorance occludes you from keeping them in good conditions) and some other do-it-yourself systems (MINUS ONE STAR). NOTE: You will probably need to complement this book with Sawyer's (Electrochemistry for Chemists), and in the case you're interested in amalgams you can look in any old preparative inorganic chemistry book like Brauer's (Handbook of Preparative Inorganic Chemistry, Volume 1 and 2, Complete 2 Volume Set).

This is a great collection for anyone that wants to include electro chemistry in a high school or college. There is enough information for a person knowledgeable in chemistry to do any of the experiments. Not all of the details are in this book but it makes up for it by a wide coverage of topics. With the price of open source potentiostats coming down to under \$100 (WheeStat and others) this opens a wide collection to students. Even if you only have access to a simple volt meter there are interesting experiments that you can do with your students. Highly recommended.

This is supposed to be only a lab text, but if you were to follow its experiments and preferably perform them in the lab, you wouldn't need a classroom text. Very thorough coverage of most aspects of electrochemistry.

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