

Importance and scope of Electrochemistry

[Electrochemistry](#) is the chapter of chemistry that deals with the relations between electrical and chemical phenomena. It is also the branch of physical chemistry that studies the relationship between electricity, as a calibration and quantitative phenomenon, and identifiable chemical change, with either electricity considered an outcome of a particular chemical change or vice-versa. These reactions involve electric charges moving between [electrodes](#) and an electrolyte (or ionic species in a solution). Thus electrochemistry deals with the interaction between electrical energy and chemical change. The practical importance of [electrochemical](#) method, the role of the processes in living organisms, and the unique features of their experimental class have led to the establishment of electrochemistry as an independent scientific discipline. Modern electrochemistry focuses on electrochemical kinetics, that is, the study of the mechanism and the laws of the behaviour of electrochemical reactions. Electrochemistry has an ever increasing impact in everybody's daily life. Other than the fact that many physiological processes in our body depend on electrified interfaces and electrochemical processes, electrochemical energy conversion and storage are directly at work in consumer [batteries](#) (like in notebooks, smart phones and car batteries) and, increasingly, in fuel cells. Many appliances of daily life, like screws, nuts, electrical connectors have been surface finished by [electroplating](#) processes, to protect them from corrosion (an electrochemical process as well) or to improve functional properties like electronic conductivity. Even more, the manufacturing of all printed circuit boards in electronic devices contains electrochemical steps for the plating of the interconnects. Even though a lot of progress has been made in the past one hundred years in the understanding and application of electrochemical processes.

Electrochemical process are highly used in various branches of industry. The chemical industry makes use of electrolysis, which is the most important process for the production of chlorine, alkalis, many oxidizing agents, fluorine, and organo-fluorine compounds. The electrosynthesis of the most varied chemical components has gained increasing importance. The production of aluminium, magnesium, sodium, lithium, beryllium, tantalum, titanium, and zinc and the refining of copper are based on electrochemical method. Hydrogen is manufactured by the [electrolysis](#) of water on a relatively limited scale, although with the increasing exhaustion of natural fuel reserves and the increasing production of electric power, this process for the production of hydrogen will increase. Protective and decorative electroplating is used in various industries. Electrochemical information converters are finding increasing use in industry. Major importance is the development of the electric automobile. The rapidly increasing demand for independent sources of [electric power](#) in industry, space exploration, and household uses has stimulated the search for new electrochemical systems with enhanced efficiency, power capacity, and safety. The most important biological processes, such as the assimilation and use of food energy, the transmission of the nervous impulse, and the detection of the visual image is impossible without taking into account electrochemical links, which are related primarily to the functioning of biological membranes. The resolution of these problems sets new tasks for theoretical electrochemistry and should significantly affect future medical practice.

Why Germany?

[Electronics](#) is one of the world's rapidly-growing industries. Germany is and will continue to be an important location for the high-end manufacturing of complex components. Germany's electrical and electronics firms manufacture more than 100 thousand different products and systems ranging from [microelectronic](#) components to electrical household appliances, automation systems, lamps and luminaires, electronic medical equipment, and automotive electronics. Total industry turnover is forecast to grow to EUR 178 billion in 2015. Germany is the European chemicals market leader with total chemical product originating in Germany equivalent to EUR 110 billion in 2014. Sixty highly developed chemical parks with excellent infrastructure represent an optimal base for chemical processors, refiners, and end-product producers. Around one third of all European chemical industry investment is made in Germany.

Germany with its German cars is one of the dominating automobile havens in the world. Germany is the home to the most popular car manufacturing units. Audi, Volkswagen, BMW and Mercedes Benz, all have had their origins in Germany and now have factories spread throughout the world. Car enthusiasts from all over celebrate their love for [automobiles](#) by visiting Germany's car museums, and factory tours. Apart from this, the scenic beauty and the roads offer an enormous experience for car and driving lovers. Automotive industry manufacturers, suppliers and service providers represent Germany's largest industry in revenue terms – generating turnover of EUR 384 billion in 2014. Automotive industry manufacturers, suppliers and service providers represent Germany's largest industry in revenue terms – generating turnover of EUR 384 billion in 2014.

Why to Attend

With members from around the world focused on learning about [Electrochemistry](#), Physical chemistry, [Surface chemistry](#) this is your one of the best opportunity to reach the largest assemblage of participants. Conduct presentations, disperse information, knowledge to meet with current and potential speakers, make a sensation with a new product line, and receive name recognition at this 2-day event. World-renowned speakers, the most recent techniques, tactics, and the newest updates in fields are hallmarks of this conference.

Conference Highlights

Principals of Eletrochemistry
Theoretical and Computational Electrochemistry
Electroanalytical Chemistry and Sensor Science
Electrochemical Energy Conversion and Storage
Bioelectrochemistry
Electrochemical surface science
Batteries and energy sources
Organic and Organometallic Electrochemistry
Corrosion Science and Technology
Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry
Applications of Eletrochemistry
Electroplating & Coatings
Organic and Bioelectrochemistry
Electrochemical Engineering
Carbon Nanostructures and Devices

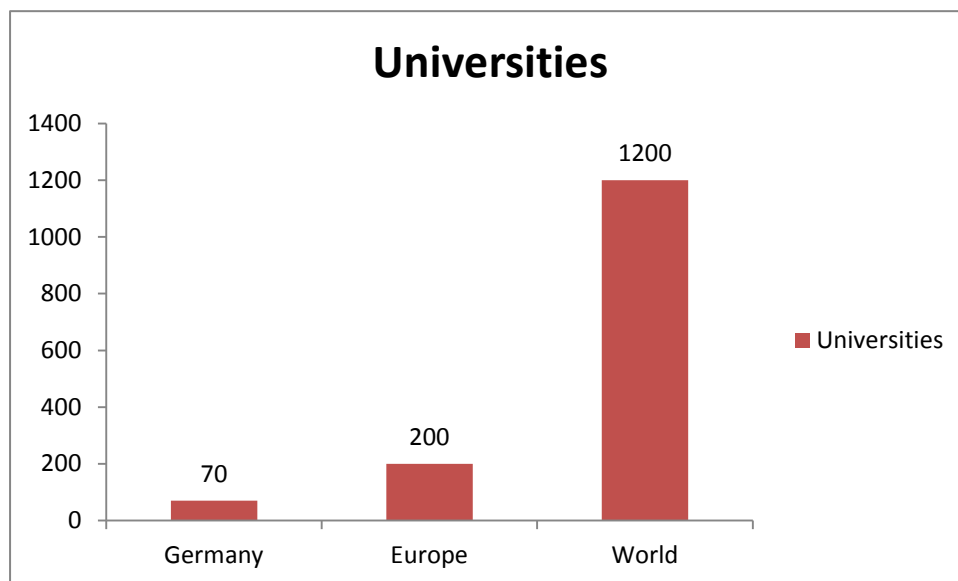
Universities associated with Electrochemistry

Major universities in Germany

University of Hamburg
University of Munich
Free University of Berlin
University of Göttingen
Heidelberg University
RWTH Aachen University
Humboldt-Universität zu Berlin

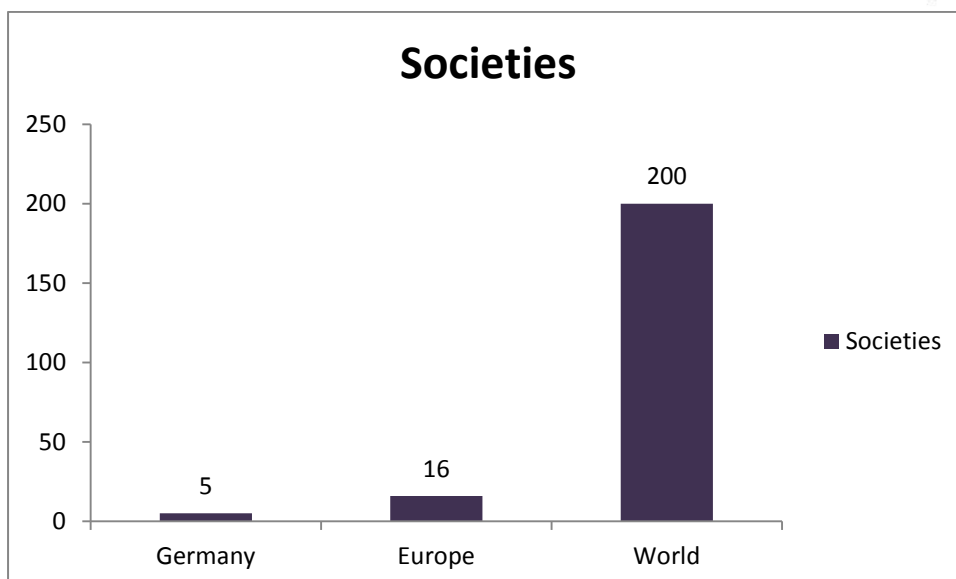
Major universities around the world

Massachusetts Institute of Technology (MIT)
University of Cambridge
University of Melbourne
University of Toronto
University of Tokyo
Peking University
Seoul National University (SNU)



Societies associated with Electrochemistry

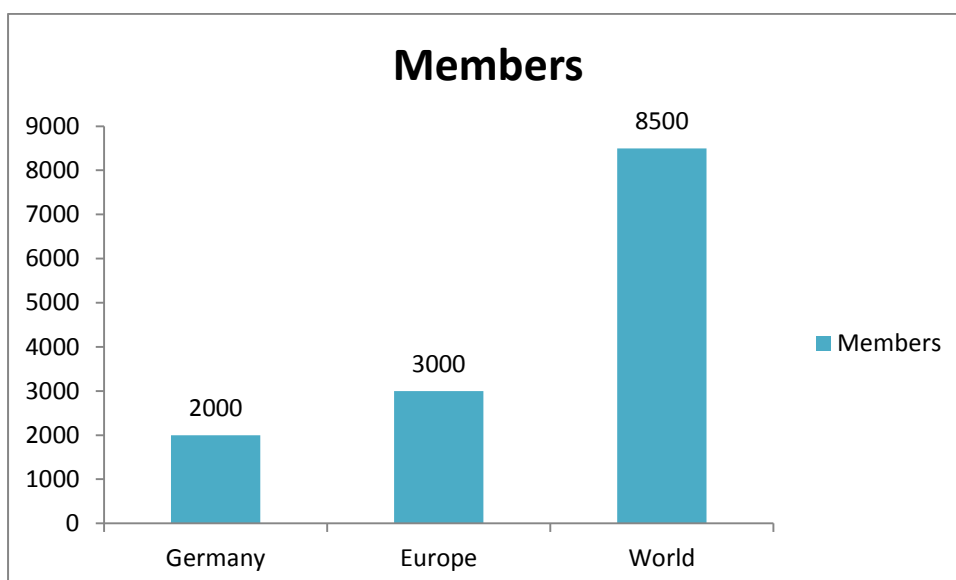
The Electrochemical Society
International society of Electrochemistry
Indian society of ElectroAnalytical chemistry
Bioelectrochemical Society
Electrochemical Society of Iran
Fuel Cell & Hydrogen Energy Association
European Federation of Corrosion: EFC
World Corrosion Organization
Corrosion Association Singapore
Indiana Corrosion Society (ICS)
American Chemical Society
Biochemical Society
Canadian Society for Chemical Technology
European Association for Chemical and Molecular Sciences
Faraday Society
Hungarian Chemical Society
Royal Society of Chemistry



Members associated with Electrochemistry

Major people around the world

Rajeshwar, Krishnan, President, Electrochemical society
Christian Amatore, President, (ISE)
S. K. Aggarwal, President, (ISEAC)
Hermann Berg, Vice-president, Bioelectrochemical Society
Morry B. Markowitz, President, (FCHEA)
Fátima Montemor, President, (EFC)
Willi Meier, Director, World Corrosion Organization
Keith Kee, President, Corrosion Association Singapore
Kate Baillie, CEO, Biochemical society



Global market value on electrochemistry

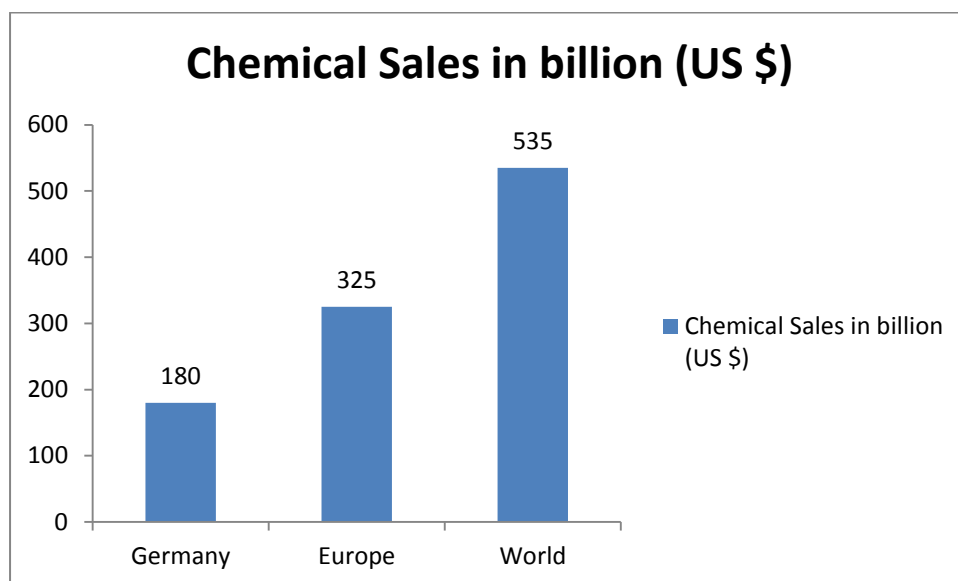
The global [Electrochemical](#) Instruments Market is segmented on the basis of products, technologies, end users, and regions. The Electrochemical Instruments Market is expected to reach \$2,205.9 Million by 2019 from \$1,713.0 Million in 2014, at a CAGR of 5.2% during the forecast period 2014 to 2019.

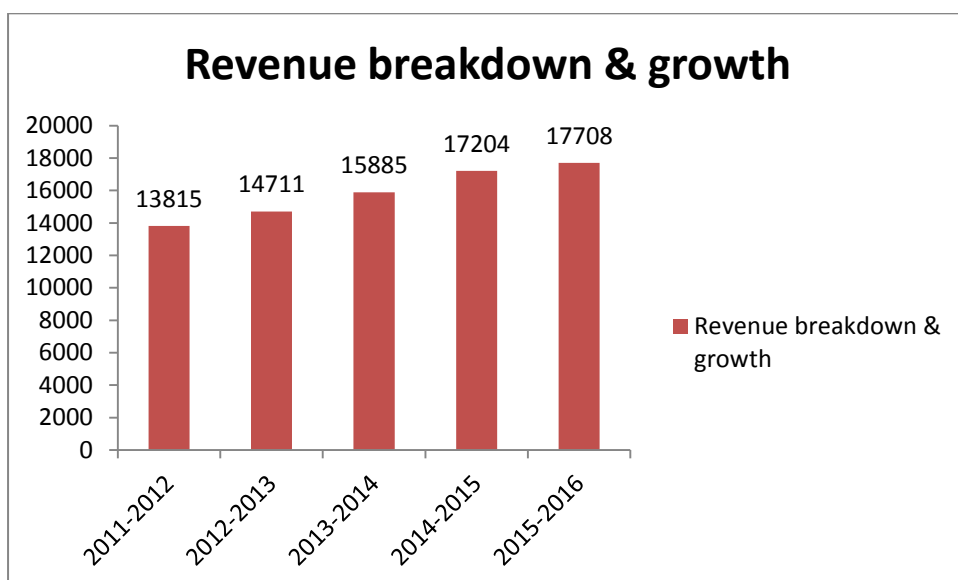
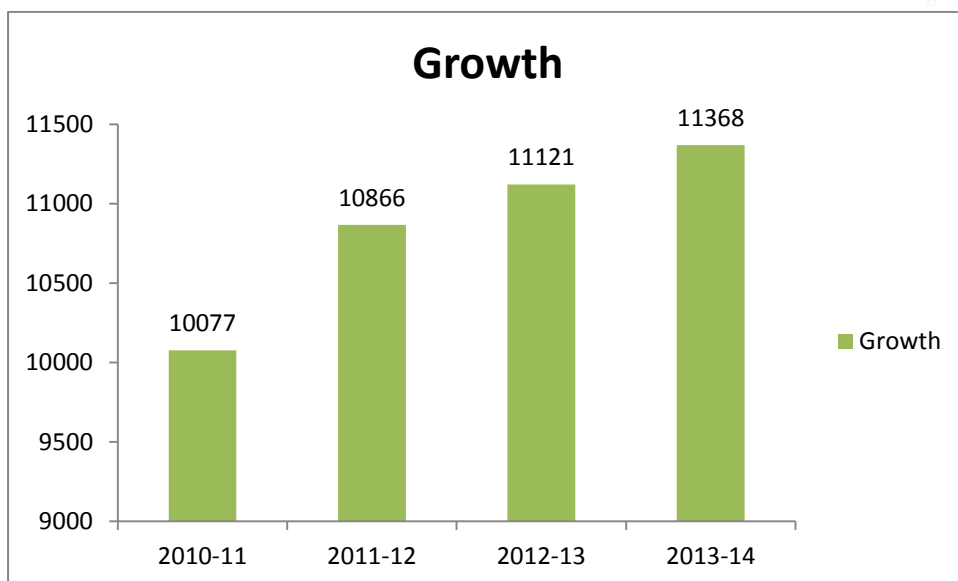
The global distributed energy storage systems market was valued at \$3.98 billion in 2014, and is estimated to reach a market value of \$9.09 billion by 2020, at a CAGR of 15.0% from 2015 to 2020. The [batteries](#) segment is expected to account for the largest share in the distributed energy storage systems market and is expected to reach \$5.78 billion by 2020 at a CAGR of 17.4% from 2015 to 2020. Ionic liquids market size is forecast to be worth over USD 2 billion by 2022. The Global Gas [Sensors](#) Market is expected to reach a value of USD 2.56 billion by 2020, at a CAGR of 5.56% over the period 2014 to 2020.

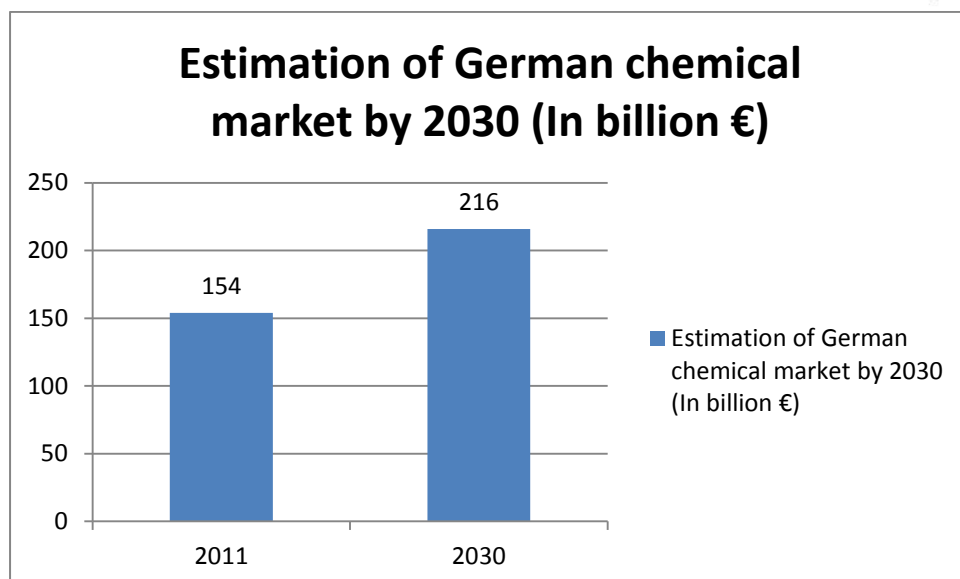
German market value on electrochemistry

Germany is already one of the world's leading energy storage markets. German energy storage market to reach \$1B by 2021. Germany is the number one fuel cell country in Europe. The [fuel cell](#) industry grew by almost \$1 billion, reaching \$2.2 billion in sales, up from \$1.3 billion in 2013. Fuel Cell Market size is expected to reach USD 25.5 billion by 2024. German output of chemicals is forecasted to grow by 1.8 per cent a year to 2030.

Electrochemical sales







Chemical Industries across the Globe

BASF, Ludwigshafen, Germany
Sinopec, Beijing, China
Dow Chemical, Midland, USA
SABIC, Riyadh, Saudi Arabia
Royal Dutch Shell, The Hague, Netherlands
ExxonMobil, Irving, USA
Formosa Plastics, Taipei, Taiwan
Lyondell Basell, Houston, USA
DuPont, Wilmington, USA
Ineos, Rolle, Switzerland
Mitsubishi Chemical, Tokyo, Japan
Bayer, Leverkusen, Germany
LG Chem, Seoul, South Korea
Akzo Nobel, Amsterdam, Netherlands
Air Liquide, Paris, France
The Linde Group, Munich, Germany
Reliance Industries, Mumbai, India
Huntsman Corp

