DEVELOPMENT OF RUSSIAN ELECTROCHEMISTRY AND THE ACADEMY OF SCIENCES

The development in Russia of electrochemistry, as of many other branches of knowledge, was associated with the Academy of Sciences. Academician M. V. Lomonosov observed, and in 1738 described, the phenomenon of passivation of iron by concentrated nitric acid. The first intrinsically electrochemical experiments were carried out in 1801 by G. F. Parrot, later to be an Academician Physicist, who constructed a horizontal voltaic pile for the purpose of his experiments. In 1803, Academician V. V. Petrov used a powerful battery made of 4200 copper and zinc plates which he designed in conjunction with J. Medzher, a mechanical engineer of the St. Petersburg Academy of Sciences, to obtain for the first time an electric arc between carbon electrodes. The discoveries made by Academician V. S. Yakobi (1837-1838) in galvanostatics laid the foundation for the first large-scale practical use of electrochemistry. The words of Yakobi, "... the smallest seed planted by science will sooner or later, but quite certainly, bring forth a harvest," continue to resound today.

The physicist Academician É. Kh. Lents discovered the law of the thermal effect of galvanic current (1842-1844); his son R. É. Lents, corresponding member of the St. Petersburg Academy, introduced into science an understanding of equivalent electroconductivity (1877).

Academician P. I. Walden (later an honorary member of the Academy of Sciences of the USSR) was a pioneer of the electrochemistry of nonaqueous solutions. The important principle which he discovered associating the electrical conductivity of a solution with the viscosity of the solvent has entered the scientific field as Walden's Law.

The honorary Member of the Academy of Sciences of the USSR I. A. Kablukov and Academician V. A. Kistyakovskii, on the basis of the concept of ion hydration, associated the Arrhenius theory of electrolytic dissociation with the views of D. I. Mendeleev. I. A. Kablukov discovered the phenomenon of anomalous electroconductivity. V. A. Kistyakovskii was the first in our country to lay the foundations of the physicochemical study of corrosion phenomena. The Laboratory of Colloidal Electrochemistry, created on his initiative, was the first research establishment in the USSR to specialize in the field of electrochemistry. In 1934, this laboratory was reorganized into the Colloidal Chemistry Institute of the Academy of Sciences of the USSR which then provided the basis for the Institute of Physical Chemistry which was founded in 1945.

Academician L. V. Pisarzhevskii was a pioneer of the introduction of electronic ideas into electrochemistry. We are considerably indebted to his influence and example in the development of electrochemistry in the Ukraine. An important contribution to Soviet electrochemistry was made by the Corresponding Members of the Academy of Sciences of the USSR N. A. Izgaryshev, G. V. Akimov and A. I. Brodskii. N. A. Izgaryshev showed the effect of ion hydration on the kinetics of electrochemical processes. A. I. Brodskii, an Academician of the Ukrainian Academy of Sciences and a pupil of L. V. Pisarzhevskii, used isotopic methods to discover the mechanism of several electrochemical processes. G. V. Akimov developed the electrochemical theory of corrosion and founded an important school of corrosion scientists. The work of Akimov laid the foundation for the systematic use in the USSR of scientific ideas in the battle against corrosion.

In our own time, electrochemical research has been widely developed in the Academy of Sciences of the USSR and includes all the main aspects of theoretical electrochemistry and many fields of applied work. In 1958 the following establishments were set up: the Institute of Electrochemistry of the Academy of Sciences of the USSR in Moscow and the Institute of Electrochemistry of the Ural Scientific Center in Sverdlovsk which specializes in high-temperature electrochemistry.

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Electrochemical studies are also carried out in several other institutes of the Academy: at the Institute of Physical Chemistry in the field of corrosion theory and electrodeposition; at the N. D. Zelinskii Institute of Organic Chemistry and the A. E. Arbuzov Institute of Organic and Physical Chemistry in Kazan, for the study of organic chemistry; and at the N. S. Kurnakov Institute of General and Inorganic Chemistry in the field of the theory of electrolytic solutions.

Electrochemistry is widely represented in the Academies of the Union Republics. Thus, the Institute of Chemistry and Chemical Engineering of the Academy of Sciences of the Lithuanian SSR is an important center for research on galvanic coatings. Research on electrocatalysis is being successfully carried out at the Institute of Organic Catalysis and Electrochemistry of the Academy of Sciences of the Kazakh SSR; on dilute electrolytes and the electrodeposition of metals at the Institute of General and Inorganic Chemistry of the Ukrainian Academy; on the electrochemistry of metals and other fields of electrochemistry at the Institute of Inorganic Chemistry and Electrochemistry of the Georgian Academy; on macrokinetics at the Institute of Heat- and Mass-Exchange of the Belorussian Academy of Sciences and the Institute of Applied Physics of the Academy of Sciences of the Moldavian SSR; and on polarography at the Latvian, Moldavian, and Kazakh Academies of Science.

Finally, active Members and Corresponding Members of the Academy direct several large industrial institutes in which electrochemistry is widely represented. These include the L. Ya. Karpov Scientific-Research Physicochemical Institute, the All-Union Scientific-Research Institute of Current Sources, and the departments of electrochemical subjects at the Universities of Moscow, Leningrad, and other higher education establishments.

Finally, the Academy of Sciences of the USSR has become the largest center of worldwide electrochemical science, drawing together all the leading Soviet scientists.

In commemorating this Jubilee in the history of the Academy of Science, Soviet scientists and electrochemists are devoting all their resources to the fulfillment of the tasks set by the 24th Session of the Communist Party of the Soviet Union and the Resolution of the Central Committee of the CPSU to the Party and the Soviet people: to achieve new successes in the development of fundamental research and actually to introduce the achievements of electrochemical science into the national economy for the good of our country and its people.