

History of ECSJ Journal Series and Introduction of Award Winners in 2022



Minoru MIZUHATA^{a,b,*†,§} and Mikito UEDA^{c,d,*†,§}

^a Deputy Editor-in-Chief, The Electrochemical Society of Japan,

Nihon-Kodokai Building 7F, 3-1-6 Nishikanda, Chiyoda-ku, Tokyo 101-0065, Japan

^b Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University,
1-1 Rokkodai-cho, Nada, Kobe 657-8501, Japan

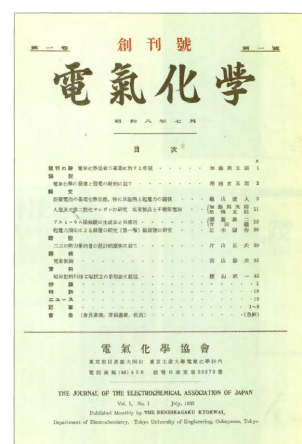
^c Executive Director in Charge of Editorial Management, The Electrochemical Society of Japan,
Nihon-Kodokai Building 7F, 3-1-6 Nishikanda, Chiyoda-ku, Tokyo 101-0065, Japan

^d Division of Materials Science and Engineering, Faculty of Engineering, Hokkaido University, N-13, W-8, Sapporo 060-8628, Japan

* Corresponding authors: mizuhata@kobe-u.ac.jp (M. M.), mikito@eng.hokudai.ac.jp (M. U.)

ABSTRACT

The Editorial Board outlines the history of publication by the Electrochemical Society of Japan as it celebrates its 90th anniversary. The history of the journal is told by the Society's strong interest in publishing and its international development in line with current trends. The growing presence of the journal is described. This issue will also include the Comprehensive Papers by the winners of the ECSJ awards. The rationale for these awards will also be explained.



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1. Introduction

Following the first Editorial article,¹ we will introduce awardees of the 2022 Society Awards of The Electrochemical Society of Japan (ECSJ) of which papers are published in the following contents with the history of the journal published from ECSJ. The journal has been one of the main activities of the society since its foundation, and the society has been publishing an English-language journal to promote exchange of information and interaction among society members as well as to show its international presence. The publication of the award-winning papers is in line with this trend.

2. The 90-year History of Journal Published from The Electrochemical Society of Japan

The Electrochemical Association of Japan (ECAJ), the predecessor of the Electrochemical Society of Japan (ECSJ), was founded on April 11, 1933,² and was approved as an incorporated association in 1935 by the former Ministries of Commerce, Industry and Education.³ The first objective of the Society was defined as

“Publication of a journal and books,” in Article 4, Section 1 of the Articles of Incorporation as shown in Fig. 1.⁴ The first issue of the Society's journal, “*Denki Kagaku* (電気化学)”, *The Journal of the Electrochemical Association of Japan*, was published on July 5, 1933, before the first annual meeting of the Society as shown in Fig. 2.⁵ The first Editor-in-Chief was KAMEYAMA Naoto (亀山直人), professor of Tokyo Imperial University, former the University of Tokyo, who was not only a researcher in electrochemistry but also a representative of the academia, serving as the first chairman of the Science Council of Japan after World War II. The articles in *Electrochemistry* begin with the inaugural address by KATO Yogoro,⁶ the first president of ECAJ, and the section of the original paper begins with Kameyama's article entitled “Fundamental Chemical Reactions of Lead Acid Batteries, Especially Relationship between Heat of Reaction and Electromotive Force.”⁷ The article consists of a criticism of a novel thermodynamic study on the formation of basic lead sulfate by Riesefeld and Saß regarding the cathode reaction of lead-acid batteries, which was being conducted in large numbers at that time.⁸ The paper is a very detailed discussion, pointing out the inconsistencies in the cited papers by successfully combining considerations with electrochemistry and thermodynamics in physical chemistry. What is surprising is that the paper completes its argument by citing something published in Germany only three months earlier. Although we have no way of knowing how the paper in German language was obtained, read,

[†]Equal contribution

[§]ECSJ Active Member

M. Mizuhata  orcid.org/0000-0002-4496-2215

M. Ueda  orcid.org/0000-0003-2068-1715

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Figure 1. Articles of Incorporation of the Electrochemical Society of Japan as described in the article in Ref. 4. The first purpose of the Society is stated in the underlined Chapter 4, Section 1: “Publication of Journals and Books.” as indicated by a red line.

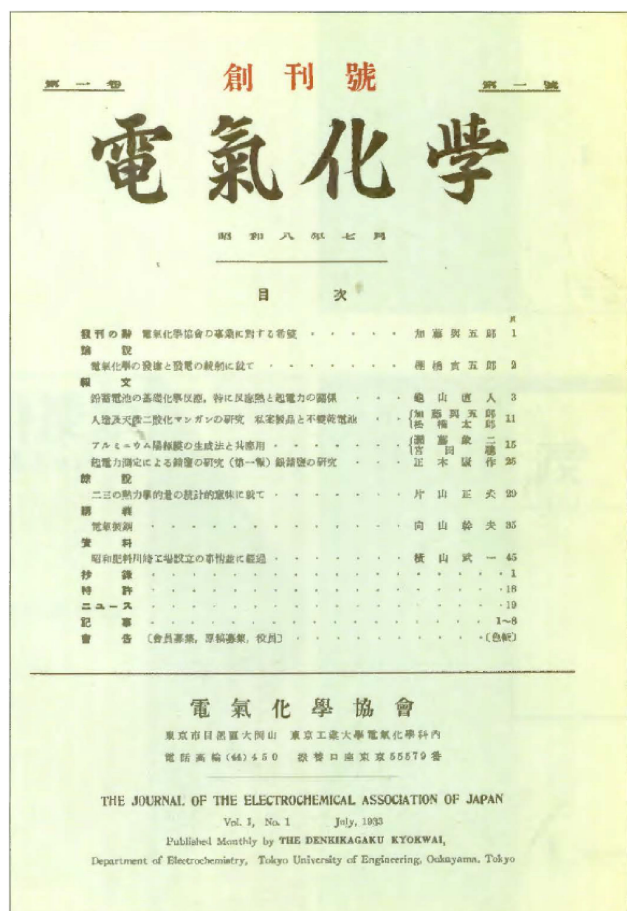


Figure 2. Cover design for the first issue of “Denki Kagaku (電氣化學/The Journal of The Electrochemical Association of Japan)” published on July 5, 1933.⁵

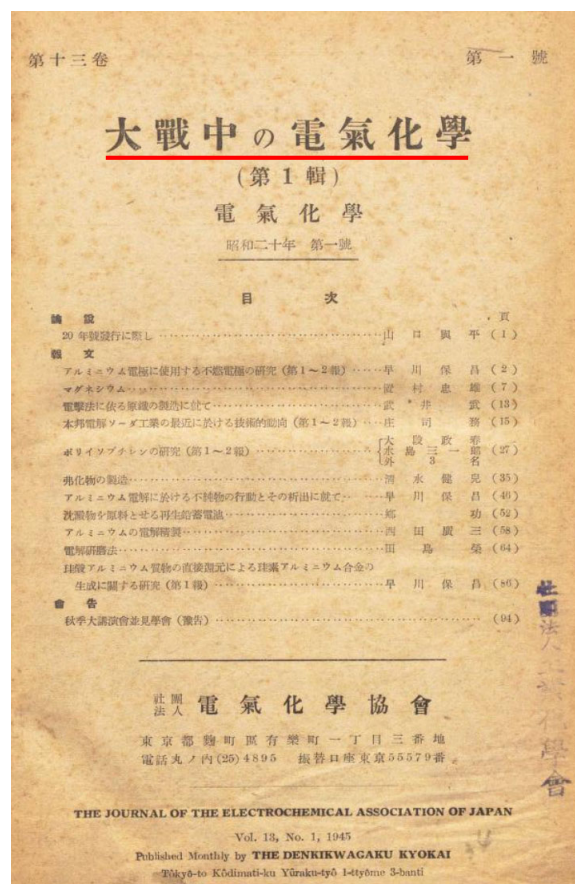


Figure 3. Cover design for the Vol. 13, No. 1, the special issue of *The Journal of The Electrochemical Association of Japan* published on October, 1946.¹⁵ Title of Issue is arranged to “Electrochemistry during World War II” as indicated by a red line.

discussed, and his paper was written, it seems to have been an extremely ambitious effort, at least for a manuscript published for the first time in an academic journal. The relationship between the cited and citing papers at that time is not included in the database, and even though the cited paper is in German and the citing paper is

in Japanese, it is interesting to examine how these discussions were repeated afterwards, leading to the current discussion of sulfation phenomena.

At that time, electrochemistry was largely derived from the field of electrical engineering, and many papers discussed it from a

physical perspective. Today, there is a great deal of research on material exploration and creation for application to electrochemical devices, but at the same time, there are many papers on solution theory and electrochemical theory, and much discussion of the establishment and systematization of the foundations of the discipline.

The name of the “Association” of former ECSJ was given in the hope of achieving results through collaboration between academia and industrial fields, and at that time, many articles from companies that contributed greatly to the founding of the society were also published.

In addition, *Denki Kagaku*, Vol. 1, No. 5, issued on December 1933, contains the proceedings of the first ECSJ meeting. The lecturers included the leaders in not only the electrochemical field but also academia and industry ones at the time, such as KATO Yōgorō,⁹ MORI Nobuhiro (森 嘉和),¹⁰ a former member of the House of Representatives, the first vice president of the Electrochemical Society of Japan, and who later founded Showa Denko K.K., OKOCHI Masatoshi (大河内 正敏),¹¹ a member of the former House of Peers and the head of Institute of Physical and Chemical Research (RIKEN), etc. The lecturers expressed their hopes for the Society and its activities. All articles are written in Japanese, but are highly documented in the form of articles.

The Journal of The Electrochemical Association of Japan had been published uninterruptedly during World War II. However, Volume 12, published in 1944, became a merged issue starting in August, and was discontinued with the October–December merger issue published in October, 1944.¹² After the war, publication resumed in January 1946, when the volume was numbered 14.¹³ It is because it was published in October 1946 as a commemorative issue delayed in publication.¹⁴ The issue was entitled “*Electrochemistry in the Great War (No. 1)*” as shown in Fig. 3, indicating a desire to continue publishing as long as manuscripts are collected.¹⁵ YAMAGUCHI Yohei (山口興平), Professor of Tokyo Imperial University, and Editor-in-Chief stated “The editorial board at that time decided to publish as much as possible in 1946, while Volume 13 was to be a commemorative issue that would preserve the valuable research results of the painstaking efforts during the World War II.”¹⁶ Although the special issue ended after only one issue, it contained 11 articles how to acquire resources efficiently and without waste, even though resources were in short supply on aluminum,^{17–19} magnesium,²⁰ iron,²¹ electrolytic sodium,²² polyisobutylene (rubber),²³ fluoride,²⁴ recycled lead,²⁵ electropolishing technique,²⁶ and clay.²⁷

The English name of the journal of *The Electrochemical Association of Japan* was changed to “*The Journal of The Electrochemical Society of Japan*” in December 1947 due to the change of the English name of the association.²⁸ This journal continued to be published until May 1961. As time went on, the number of papers published increased, and a momentum grew for the publication of an English-language edition to make the research results known internationally. By this time, all articles published in the journals were written in Japanese. As time went by, the number of papers published increased and there was a growing momentum to publish an English version of the journal to disseminate research results internationally. “Overseas supplementary edition” of *The Electrochemical Society of Japan* has begun to be published in 1957 by the Publication Committee of ECSJ, of which Editor-in-Chief was SUGINO Kiichiro (杉野喜一郎) of Tokyo Institute of Technology.²⁹ Initially, the edition was compiled as an abridged version of previously published papers written in Japanese. This English-language journal was rarely published for the domestic market and was positioned as an information journal to promote the achievements of electrochemistry in Japan. For this purpose, 350 copies were printed and issued to 33 overseas academic publishers. From 1961, The renamed “*Journal of The Electrochemical Society*

of Japan” was issued by the Publication Committee of ECSJ, of which Editor-in-Chief was FUNAKI Koemon (舟木好右衛門) of Tokyo Institute of Technology, it began to include original papers written in English besides translated abstract papers.³⁰

At the same time, the name of the journal in Japanese was changed to “*Denki Kagaku oyobi Kogyo Butsuri Kagaku* (電気化学および工業物理化学)”, which means electrochemistry and industrial physical chemistry in June 1961, and its English name was changed to “*Denki Kagaku*,” in order to classify from the English-language journal for referring from overseas.³¹

As researchers involved in electrochemistry frequently published their articles in English, the demand regarding the sharing of information among members increased. As a result, members began to request the submission of original papers in English to *Denki Kagaku* itself. In response, the English-language journal was dissolved in 1969, and *Denki Kagaku* began accepting papers in English. In the first issue, the English article entitled “The Magnetic and Semiconducting Properties of $\text{CoFe}_2\text{O}_4\text{-ZnFe}_2\text{O}_4$, and $\text{CoFe}_2\text{O}_4\text{-Co}_3\text{O}_4$ Polycrystals” was firstly published by Kumashiro et al.³²

One of the most important projects undertaken during the time that *Electrochemistry* has been in publication has been Special Issues Series. This project, initiated in 1988, aimed to increase the number of papers submitted in English, and was published twice a year, with issues composed mainly by original papers. The special issue has been renamed Special Feature and has continued for 66 times to date as shown in Table 1.

Denki Kagaku changed to current journal name, “*Electrochemistry*” from Volume 68, in January 1999. Editor-in-Chief WATANABE Masahiro, Professor of Yamanashi University, stated that this change was due in large part to a change in format, such as changing the size of abstracts from B5 to A4 and eliminating offset printing, but also to a change in the title to an internationally accepted title using English language.³³

Since that time, the question of which journal a researcher submitted his/her research to has been used as an indicator for evaluating the research of individual researchers. This is because the Journal Impact Factor, which is one of the factors that lead to the evaluation of journals with a number of citations, came to attract attention as an easy-to-understand quantitative index. Although this indicator does not necessarily represent the value of research, this factor could not be excluded in order to be selected for submission.

In fact, until the predecessor journal, submissions were not accepted from non-members of ECSJ in principle, and the printed version of the journal was not distributed to non-members in principle. In other words, the journal was published based on the idea that the journal was for mutual exchange of information among members and that the information can only be obtained by joining the Electrochemical Society of Japan. Naturally, this idea was completely at odds with the value of the “many citations” indicator, and the Society and the editorial board continue to be plagued by inversions of its value and the undervaluation of the domestic journal.³⁴

Since that time, many journals have begun to use electronic submission systems for submission and electronic publication. This approach has resulted in a significant reduction in the time from submission to publication (and when readers can read it) for authors, and all the analog hassles of mailing, paper review, etc. which have become an impediment to this effort.

In the beginning of 1990’s, an electronic file distribution, now taken for granted, was unthinkable, and papers had to be photocopied at the library or requested by postcard from the author reverently, who would then send it to you by mail. This shift in values required a large budget, and the society had to come up with a solution to the conflict with the value of public interest in scholarly output that began around that time. As a result, the endowment for the 70th and 80th anniversaries has been largely devoted to the

Table 1. History of Special Features of *Denki Kagaku (Presently Electrochemistry)* (Vol. 56–66) and *Electrochemistry* (vol. 67–). The special feature in Volume 61, Issue 7 was planned to commemorate the 60th anniversary of the ECSJ and was not numbered.

No.	Vol.	Issue	Year	Subjects	No.	Vol.	Issue	Year	Subjects
66	90	10	2022	Novel Aspects and Approaches to Experimental Methods for Electrochemistry	36	74	8	2006	Leading Edge in Organic Electrochemistry
65	89	2	2021	Fluorine Chemistry and Materials for Electrochemistry	35	74	2	2006	Sensing and Surface Science
64	88	5	2020	Frontiers of Carbon Materials	34	73	8	2005	Molten Salts vis-à-vis Ionic Liquids-These Future Prospects
63	88	2, 3	2020	New Developments of Electrochemical Capacitors	33	72	12	2004	The Latest Development in Green Electrochemistry
62	87	5	2019	New Developments of Batteries and Fuel Cells	32	72	6	2004	Electrochemical Processing of Nanomaterials
61	87	2	2019	Advances in Functional Electrodes	31	71	12	2003	The Forefront of Science and Technology for Lithium Batteries
60	86	5	2018	Electrode-Electrolyte Interface –Design and Characterization–	30	71	6	2003	State-of-the-art in Chemical Sensor
59	86	2	2018	Molten Salts and Ionic Liquids –Fundamentals and Novel Applications–	29	70	12	2002	New Fuel Cells for Portable Power Sources
58	85	10	2017	Development of Innovative Battery Technology	28	70	6	2002	New Trends in Photo-energy Conversion
57	85	5	2017	The Current Situation and Challenges in Organic and Organic-inorganic Photovoltaics	27	69	12	2001	Electrochemistry of Molecular Functional Devices
56	84	10	2016	Recent Research Progress on Electrochemical Energy Materials with Advanced Analytical Methods	26	69	6	2001	Developments in Capacitor Technologies
55	84	5	2016	Cell Analysis Based on Bioelectrochemistry	25	68	11	2000	Electrochemistry of Biofunctional Substances
54	83	10	2015	Innovative Battery Development	24	68	6	2000	Solid State Electrochemistry: From Science of Non-stoichiometry and Point Defect to Advanced Applications
53	83	5	2015	Functionality and Application of Carbon Materials	23	67	12	1999	Electrochemistry of Ordered Interfaces
52	82	10	2014	Solid State Ionics: Basics and Application for New Energetic Technologies	22	67	6	1999	New Trends in Molten Salt Chemistry and Electrochemistry
51	82	5	2014	Cutting-edge Analysis of Surfaces and Interfaces and Its Impact in Electrochemistry	21	66	12	1998	Electrochemistry of Intercalation
50	81	10	2013	Advanced Capacitor Technologies for Energy Innovation	20	66	6	1998	Advances in Electrochemistry for Environmental
49	81	5	2013	Organic Electrochemistry en route for a Greener Innovation	19	65	12	1997	Advances in Science and Technology of Electrolytic Processes
48	80	10	2012	Increasing Demands for Next Generation New Rechargeable Batteries	18	65	6	1997	New Developments in Electroactive Supramolecular Systems
47	80	5	2012	New Frontiers in Combining the Life Science and Electrochemistry	17	64	12	1996	New Developments in Chemical Sensors
46	79	10	2011	Progress Towards the Development of Green Sustainable Chemistry Using Photofunctional Interfaces	16	64	6	1996	New Developments in Fuel Cells
45	79	5	2011	Progress Towards World-Wide Dissemination of Polymer Electrolyte Fuel Cells	15	63	12	1995	New Developments in Bioelectrochemistry
44	78	5	2010	Rechargeable Batteries as Innovative Energy Storage Devices	14	63	6	1995	The Latest Developments in Electronic Materials and Related Technologies
43	78	2	2010	New Developments in Electrochemical Fabrication of Functional Materials	13	62	12	1994	New Developments in Organic Electrochemistry
42	77	8	2009	Molten Salts and Ionic Liquids - In Novel View of Liquid Electrolyte	12	62	6	1994	Spectroscopy and Electrochemistry
41	77	2	2009	Accelerated R&D of Solid Oxide Fuel Cells with Lowering Operation Temperature	11	61	12	1993	Materials and Reaction of Secondary Batteries
40	76	8	2008	Bioelectrochemistry for Observation, Operation and Utilization of Living Systems	*	61	7	1993	60th Anniversary Special Issue - Special Issue on Communication
39	76	2	2008	Photoelectrochemistry: From Nano Materials to Devices	10	60	12	1992	Molecular Functional Electrodes - Fundamentals and Applications
38	75	8	2007	Recent Progress and Future Aspects of Capacitors	9	60	6	1992	Preparation and Characterization of Functionalized Surfaces
37	75	2	2007	Development of Materials and Evaluation Methods for PEFCs	8	59	12	1991	Future Perspective of Electronic Materials
					7	59	6	1991	Electrochemistry and Environmental Chemistry
					6	58	12	1990	Chemical Sensors
					5	58	6	1990	Fundamentals and Applications of Solid State Electrochemistry
					4	57	12	1989	Fundamentals, Applications and Electrochemistry of Light
					3	57	6	1989	Batteries
					2	56	12	1988	Bioscience and Applications
					1	56	7	1988	Electronic Materials and Devices

journal's digitization efforts. At the very same time that the journal was renamed "*Electrochemistry*", the Japanese government started operating the first version of J-STAGE system,³⁵ and former "Journal@rchive"³⁶ began to include historical publications published in print form in the past in 1998. The Electrochemical Society of Japan (ECSJ) which had already published a 70-volume journal at that time was also invited to join the J-STAGE Archive, but since

ECSJ had decided to start operating its own system and to allocate the foundation memorial donation for its preparation, the journal was not published on J-STAGE until 2011. Starting on January 2012, *Electrochemistry* will be published on J-STAGE, which has been improved to Version 3, under MASUDA Hideki of Tokyo Metropolitan University, Editor-in-Chief.³⁷ Each published article was to be assigned a unique Digital Object Identifier (DOI) and

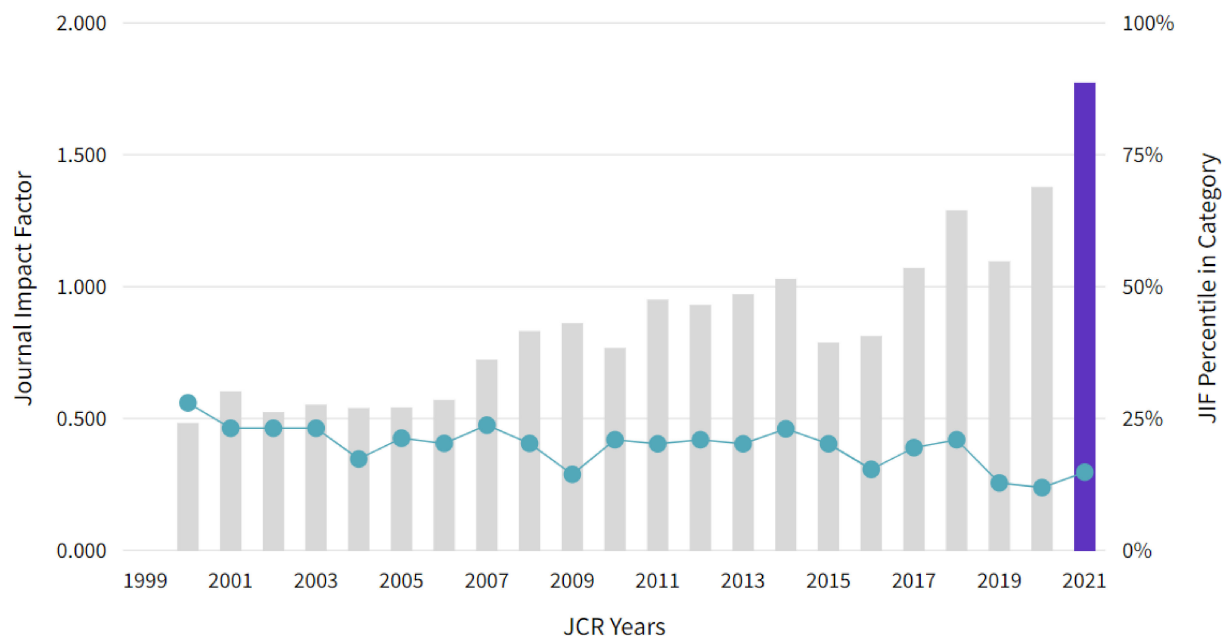


Figure 4. Journal Impact Factor and JIF Percentile in Category in published journals in electrochemical field for *Electrochemistry* after establishment in 1999. Although JIF has steadily increased since the journal was renamed *Electrochemistry*, JIF Percentile has relatively decreased due to the launch of many new journals related to the field of electrochemistry. Reprinted from Journal Citation Report 2022 Copyright Clarivate Analytics.

distributed piece by piece. This made the papers freely accessible to non-members of the Society, and greatly increased the number of overseas viewers. Although after that, the JIF temporarily stagnated, it had increased from an average of ca. 1 to 1.77 by 2022 as shown in Fig. 4.

The history of the Journal issued from ECSJ is shown in Fig. 5 with the ISSN codes.³⁸ By deriving the journal “*Denki Kagaku* (2018–)” from *Electrochemistry* for communication among the members of the society. *Electrochemistry* was published bimonthly with a fully electronic version in 2018,³⁹ copyright will belong to the authors starting with Volume 88, Issue 3, published in May 2020;⁴⁰ APC will be established, the journal will become an open access journal.⁴¹ *Electrochemistry* is currently undergoing a series of reforms, including the declaration that it was accepted for inclusion in Directory of Open Access Journals (DOAJ) starting in 2021,⁴² reverting to a monthly journal in 2022, and it will publish all articles in English from 2023.⁴³ Starting in 2018, we are publishing Comprehensive Papers of the awardee who have been requested for publication of the society awards of ECSJ.

The publication of *Electrochemistry* is one of the major projects of the Society, but it would not be possible without the cooperation of many authors and reviewers, including the members of the Society. For the future development of the journal, we hope that readers will browse the journal with interest and submit papers.

3. Introduction of 2022 Award Winner

3.1 The Award of The Electrochemical Society of Japan (Takei Award)

The Award of ECSJ (Takei Award) in 2022 are given to KANAMURA Kiyoshi.

The awardee, Kanamura is currently a professor of Tokyo Metropolitan University. He earned Doctor of Engineering from Kyoto University in 1987. He was an assistant professor at Kyoto University from 1986 to 1991 and an associate professor from 1994 to 1997. In 1998, he moved to Tokyo Metropolitan University as an associate professor and professor from 2002. Over a long period of time, Kanamura has been involved in the research and development

of storage batteries and fuel cells. In particular, he has clarified the reaction at the interface between the electrocatalyst and the electrolyte in batteries by in-situ infrared spectroscopy and XPS measurements,^{44–48} which has been recognized as a significant contribution to electrode and battery design. Single-particle measurement of active materials for lithium batteries using micro electrodes has also greatly advanced the evaluation of battery performance.^{49,50} Based on those findings, he developed and evaluated all solid-state batteries for electric vehicles.⁵¹ His award paper in this issue is mainly related to his achievement for the multiscale researches on lithium ion and lithium metal batteries.⁵²

3.2 Scientific Achievement Award of The Electrochemical Society of Japan

Scientific Achievement Awards of ECSJ in 2022 are given to EINAGA Yasuaki and DOKKO Kaoru.

One of the awardees, Einaga is currently a professor of Keio University. Einaga received his PhD in engineering from University of Tokyo in 1999, and was an assistant professor in same year. In 2001, he moved to Keio University as a lecturer and associate professor from 2003, and professor from 2011. Einaga has been conducting research and development on the creation of diamond electrodes and their application to electrochemical sensors that can detect trace amounts of metals and monitor them in vivo.^{53–57} A highly sensitive detection method using diamond electrodes contributed to the development of a continuous chlorine concentration measurement system. His award paper in this issue is mainly related to his achievement for an application of boron-doped diamond electrodes.⁵⁸

Another awardee, Dokko is currently a professor of Yokohama National University. He received his PhD in engineering from Tohoku University in 2001. In 2007, he was appointed at Tokyo Metropolitan University as an assistant professor from 2007. In 2008, he moved to Yokohama National University as an associate professor, and professor from 2016. Dokko has been studied electrochemical reactions in non-aqueous electrolytes. In particular, he has focused on research of basic physical and electrochemical properties of solvated ionic liquids, a 4 V-class lithium-ion battery

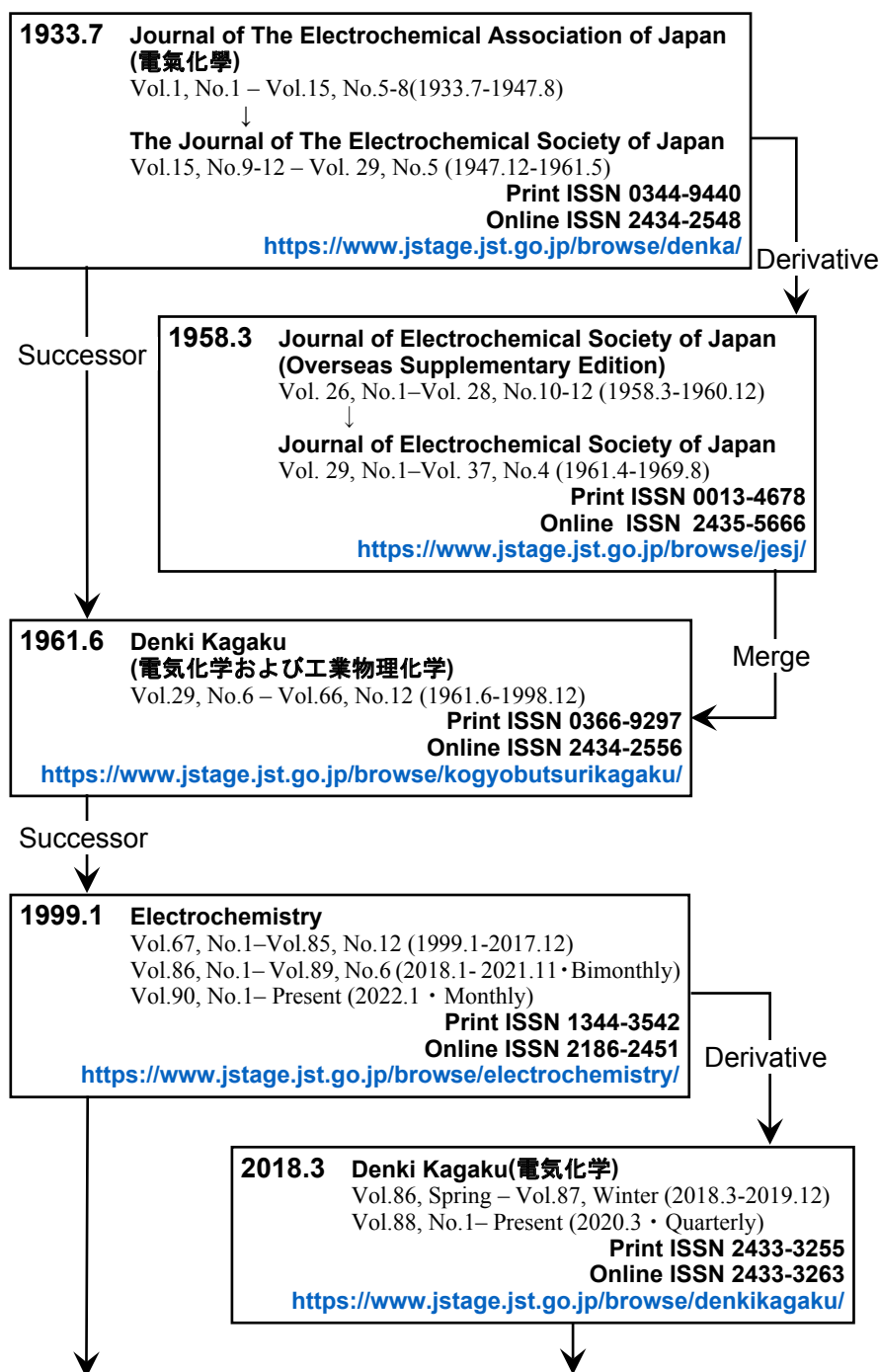


Figure 5. History of the journals issued from The Electrochemical Society of Japan. Remixed from Ref. 38. Copyright 2019 The Electrochemical Society of Japan.

with long-term operation was developed using the liquid mixture of grime and Li salt.^{59–62} His work on solvated electrolyte salt has been cited over 10,000 times by researchers around the world and has contributed significantly to the battery field. His award paper in this issue is mainly related to his achievement for fundamental properties of solvate electrolytes and their application in batteries.⁶³

3.3 Technical Development Award of The Electrochemical Society of Japan (Tanahashi Award)

Technical Development Awards of ECSJ (Tanahashi Award) in 2022 are given to the following one group.

The awardees for Development of Low Resistance 3000 F Large Lithium Ion Capacitor and Its Application to Consumer Products are ANDO Nobuo (Researcher of Musashi Energy Solutions Co., Ltd.),

KOJIMA Kenji (General Manager, Advanced Technology Development Dept. of Musashi Energy Solutions Co., Ltd.), NAGURA Satoshi (Manager, Development Dept. of Musashi Energy Solutions Co., Ltd.), and TAGUCHI Makoto (General Manager, Development Dept. of Musashi Energy Solutions Co., Ltd.). They developed a lithium-ion capacitor (LIC) with high power, long life, and high energy density by applying lithium ion pre-doping to the electrodes for improving the low energy density in capacitors, which are energy storage devices.⁶⁴ The LIC achieves excellent high input/output characteristics with long life and maintenance-free operation, and the products are used for energy storage in solar and wind power generation. Their achievement for development of low resistance 3000 F large lithium ion capacitor and application to commercial products has already published in Ref. 65.

3.4 Young Researcher Award of The Electrochemical Society of Japan (Sano Award)

Young Researcher Awards of ECSJ in 2022 are given to SHIDA Naoki, YAMAMOTO Kentaro, and YAMAMOTO Takayuki.

One of the awardees, Shida is currently an assistant professor of Yokohama National University. Shida received his PhD in engineering from Tokyo Institute of Technology in 2016. He continued his research as a JSPS Research Fellow PD from 2016. In 2018, he was a specially appointed assistant professor at Tokyo Institute of Technology. Shida was awarded for his work on the analysis of coordination behavior of electrolytes in organic electrolytic reactions and its application to strategic electrolyte design. His research focuses on the electrode electron transfer of Π -conjugated compounds and the associated molecular transformations.^{66–69} Through his research, he designed an electrolyte for highly efficient organic electrosynthesis and found that the reaction proceeds with high efficiency in a MeNO_2 electrolyte dissolving LiClO_4 .^{70,71} His award paper in this issue is mainly related to his achievement for Electrosynthesis Governed by Electrolyte - Case Studies that Give Some Hints for the Rational Design of Electrolyte.⁷²

The second awardee, Yamamoto Kentaro is currently an associate professor of Nara Women's University. He received his doctoral degree of human and environmental studies from Kyoto University in 2015. He continued his research as a JSPS Research Fellow PD from 2016. In 2018, he was a specially appointed assistant professor at Tokyo Institute of Technology. Yamamoto was awarded for his research on the creation of electrode materials based on electron-theoretic design guidelines through advanced analysis using synchrotron radiation X-rays. Using operando total reflection X-ray fluorescence absorption spectroscopy and depth-resolved X-ray absorption spectroscopy, he observed the formation of a unique electronic structure at the electrode/electrolyte interface of LiB, which he identified as the starting point for LiB degradation.^{73–75} Based on these knowledges, he designed and characterized an all-solid-state fluoride ion secondary battery as a candidate for post-LiB.⁷⁶ He contribute several papers for operando analysis in this journal.^{76,77}

Another awardee, Yamamoto Takayuki is currently an assistant professor of Kyoto University. He received his PhD of Energy Science from Kyoto University in 2016. He continued his research as a JSPS Research Fellow PD from 2016 and became a research fellow at Kyoto University in the same year. Yamamoto received the award for his work on next-generation storage batteries using ionic liquids and various charge carriers. Yamamoto was given this award for his work on next-generation storage batteries using ionic liquids and various charge carriers. He is conducting research on battery development using ionic liquids as electrolytes. He is reported as the research on the performance enhancement of sodium secondary batteries using inorganic ionic liquids and inorganic-organic hybrid type ionic liquids,^{78–80} the research on the development of electrolytes for potassium secondary batteries and their characterization,⁸¹ and the research on the development of fluoride shuttle batteries as next-generation storage batteries.⁸² His award paper in this issue is mainly related to his achievement for next-generation rechargeable batteries utilizing ionic liquids and various charge carriers.⁸³

3.5 Excellent Paper Award of The Electrochemical Society of Japan

In 2022, four papers are awarded from 93 published papers in 2021 which are listed in the list of references.^{84–87}

4. Summary

Electrochemistry has also published Volume 90 before the 90th anniversary of the Electrochemical Society of Japan. Although the

role of the journal has changed over the years, the editorial committee is now making every effort to make the research achievements of the members widely delivered. Above all, the review process is expeditious, as the journal is now published early, with an average of five weeks from submission. The Editorial Board hopes that many researchers will contribute as authors.

The covers are designed with electrochemistry-related content; see Ref. 88 for cover designs through the 1990s.

Another interest of the authors is that prior to publication of *Denki Kagaku* (means Electrochemistry), which was published in 1933 to coincide with the founding of ECSJ, there was another “DENKI KAGAKU (Electrochemistry),” which was published from 1916 to 1921 by the DENKI SEKAISHA (電気世界社) which means “Electric World Company”,^{89,90} and the other “*Denki Kagakukai Kaiho*” (電気化学會々報, *Journal of the Alumnus Electrochemical Society of Japan*),⁹¹ and “*Denki Kagaku Kaishi*” (電気化学會誌, *Journal of the Electrochemical Society of Japan*)” published by DENKI KAGAKUKAI (電気化学會), in 1930–1933 at least.⁹² It should be noted that many of the founding members of ECSJ were also involved in the editing of these journals, which originated as a special issue of *Electrochemistry* in DENKI SEKAI (Electric World) published in September 1915. If the former Electrochemical Society had persisted and continued to the present, we would have had a history of more than 100 years of the society. We hope to have the opportunity to summarize it as a prehistory of the Electrochemical Society of Japan on another occasion.

CRedit Authorship Contribution Statement

Minoru Mizuhata: Conceptualization (Equal), Data curation (Equal), Writing – original draft (Equal)

Mikito Ueda: Conceptualization (Equal), Data curation (Equal), Writing – original draft (Equal)

Conflict of Interest

The authors declare no conflict of interest in the manuscript.

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