



Citation: Szejnberg A. (2021) The Eminent Russian German Chemist Friedrich Konrad Beilstein (1838-1906) in the Literature between the 19th and 21st Centuries. *Substantia* 5(1): 135-156. doi: 10.36253/Substantia-1097

Received: Sep 12, 2020

Revised: Nov 30, 2020

Just Accepted Online: Dec 01, 2020

Published: Mar 01, 2021

Copyright: © 2021 Szejnberg A. This is an open access, peer-reviewed article published by Firenze University Press (<http://www.fupress.com/substantia>) and distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Competing Interests: The Author(s) declare(s) no conflict of interest.

Historical Articles

The Eminent Russian – German Chemist Friedrich Konrad Beilstein (1838-1906) in the Literature between the 19th and 21st Centuries

ALEKSANDER SZTEJNBERG

University of Opole, Oleska 48, 45-052 Opole, Poland

E-mail: a.szejnberg@uni.opole.pl

Abstract. Friedrich Konrad Beilstein (1838-1906) was one of the most prominent chemists of the second half of the nineteenth century. His life and scientific achievements were described in the literature published between the 19th and 21st centuries in different countries. The purpose of this paper is to familiarize readers with the important events in the life of Beilstein and his research activities, in particular with selected results of his experimental studies. The names of authors of biographical notes or biographies about Beilstein, published in 1890-2018, and literature on his correspondence are given. In addition, a list of his publications is included.

Keyword: F. K. Beilstein, Organic chemistry, Beilstein test, Handbuch der organischen Chemie, Russia, Germany – XIX century.

1. THE IMPORTANT EVENTS IN BEILSTEIN'S LIFE

Friedrich Konrad Beilstein (Fyodor Fyodorovich Beil'shtein, Фёдор Фёдорович Бейльштейн) was called a man of high rank in the profession¹ as well as a man of extraordinary erudition and excellent language skills.² One hundred and fourteen years have passed since his death, but in that time little has appeared in the literature about this outstanding man. He went down in the history of chemistry as one of the creators of synthesis in organic chemistry, as well as a person who for a long period of his life systematized organic compounds.

Beilstein was born into a family of German emigrants in St. Petersburg on February 5 [according to the Julian calendar (Old Style); Feb. 17, by the Gregorian calendar (New Style), adopted in Russia on February 1, 1918] 1838, and he was the son of Karl Friedrich Beilstein (1809-1865), and Katharina Margarete (née Rutsch) (1818-1883). His grandfather moved to Russia in his youth from the city of Darmstad.³

At the age of 14, after study at *Petrishule*,⁴ the excellent German school of the Russian capital, he continued his education (September, 1853-1855) at Heidelberg, where his interest in chemistry was inspired and directed by Robert Bunsen (1811-1899).⁵ In 1855, he transferred to Munich, where he

listened to lectures of Justus von Liebig (1803-1873) as well as he studied mathematics and physics. In Munich, under Philipp von Jolly (1809-1884) he completed his first experimental investigation *Ueber die Diffusion von Flüssigkeiten* (Concerning the Diffusion of Liquids).⁶ In April 1856, he returned to Heidelberg, where he worked under Bunsen until March 1857. Then he went to Göttingen where, under Friedrich Wöhler (1800-1882), he established murexide as the ammonium salt of purpuric acid.⁷ In February 1858, at the age of 20, he submitted his thesis *Ueber das Murexid* to the Philosophical Faculty of the University of Göttingen and obtained his doctor's degree in Philosophy.⁸ In October 1858 he went to Paris where he worked in the laboratory of Charles-Adolphe Wurtz (1817-1884) in the *École de Médecine* until September 1859. Then he moved to Breslau (now, Wrocław, Poland), where he became the laboratory assistant of Carl Jacob Löwig (1803-1890).

In 1860, he was invited by Wöhler to return to Göttingen, where he spent six years actively engaged in organic chemistry experimental research.⁹ In the same year, he attended the first ever International Congress of Chemists held in Karlsruhe (Germany) on 3-5 September. In November, as a private docent at the University of Göttingen, he began to lecture. In 1865, he was appointed extraordinary professor. From this year, together with Hans Hübner (1837-1884) and Rudolph Fittig (1835-1910), he continued editing *Zeitschrift für Chemie* (1865-1871), founded by August Kekulé (1829-1896).¹⁰

In 1866, at the age of 28, Beilstein was invited to succeed Dmitri Ivanovich Mendeleev (1834-1907) at the Imperial Technological Institute of St. Petersburg, where he subsequently taught for 30 years. His duties included lecturing on general chemistry (inorganic, organic and theoretical), laboratory management and conducting laboratory classes on analytical chemistry. He performed these duties until 1891, when after 25 years of work and approval as an honorary professor, he still worked as a professor until 1896. In that year, professor Mikhail Dmitrievich Lvov (1849-1899) became his successor.¹¹

Since 1867, in parallel with his professorship at the Imperial Technological Institute, he lectured in chemistry at the Nikolaev Engineering Academy and was a chemist in the Council of Trade and Manufactures (CTM).¹² In 1868, he was one of the founding members of the *Russkoye Khimicheskoye Obshchestvo* (Russian Chemical Society) at the Saint Petersburg Imperial University. For his scientific work, in particular for his experimental studies, in 1874 he was elevated to the degree of Doctor of Chemistry Imperial Moscow University.¹³

Beilstein was appointed official delegate of CTM to almost all International Expositions, starting from Paris in 1867. After visiting an exhibition in Vienna, together with Alexander Kirillovich Krupsky (1845-1911), they wrote a book in Russian called *Factory Chemical Industry of Western European Countries at the Vienna Universal Exhibition of 1873*. It was published in 1874.¹⁴ A year earlier, Beilstein's book entitled *Die chemische Grossindustrie auf der Weltausstellung zu Wien im Jahre 1873* was published in Leipzig.¹⁵

"Beilstein's international prestige was to a certain extent contributed by his personal qualities: great erudition, interest in social life and excellent knowledge of languages, which allowed him to take an active part in the work of various international congresses, exhibitions, in celebrations of anniversaries. In addition to Russian and German, French and English, Beilstein was fluent in Italian and Swedish."¹⁶

Beilstein's participation in the scientific celebrations abroad

Beilstein repeatedly was a representative of the Imperial Saint Petersburg Academy of Sciences on anniversaries, e.g. University of Halle (1894). In 1900, he visited Berlin to participate in the conference devoted to the 200th Anniversary of Royal Prussian Academy of Sciences.¹⁷ Figure 1 is a photography made during this celebration.¹⁸ Benjamin Harrow (1888-1970) inserted this photo on the one of first pages of his book entitled *Eminent Chemists of Our Time*. He also wrote that it "showing several eminent chemists was taken at one of the international scientific gatherings."¹⁹

Photograph was published by Harrow thanks to the kindness of the Dutch chemist Ernst Julius Cohen (1869-1944).²⁰ From the left to right are standing: the German chemist Albert Ladenburg (1842-1911),²¹ the Danish chemist and historian of chemistry Sophus Mads Jørgensen (1837-1914),²² the Finnish chemist and historian of chemistry Evard Immanuel Hjelt (1855-1921),²³ the German chemist Hans Heinrich Landolt (1831-1910),²⁴ the German chemist Clemens Alexander Winkler (1838-1904),²⁵ who discovered germanium in 1866, and the British chemist and historian of chemistry Thomas Edward Thorpe (1845-1925).²⁶

To the left of Beilstein, who sat second from the left, was the Dutch chemist Jacobus Henricus van't Hoff (1852-1911),²⁷ a Nobel Laureate in Chemistry in 1901, and on the right - the Scottish chemist William Ramsay (1852-1916),²⁸ who discovered of inert gaseous elements in air (neon, argon, krypton, and xenon) and was awarded the Nobel Prize in Chemistry in 1904, the Russian chemist D. I. Mendeleev,²⁹⁻³⁰ who discovered the Periodic Law in



Figure 1. Beilstein with the group of the prominent chemists (Public domain, from reference 18).

1871, the German chemist Adolf von Baeyer (1835-1917),³¹ who received the Nobel Prize in Chemistry in 1905, and the Italian chemist Alfonso Cossa (1833-1902).³²

Death of Beilstein

Beilstein died of a heart attack on October 5 (Old Style); Oct. 18 (New Style) 1906. His funeral took place on October 9 at the Volkov Cemetery in St. Petersburg.³³ In 1945, the Russian-American chemist Vladimir Nikolayevich Ipatieff (1867-1952) wrote in his memoirs: “When I entered the auditorium for a meeting of Phys.-Chem. Society, it has already begun, and the chairman asked everyone to stand up to honor the memory of the deceased. When I asked who died, I was told that Beilstein died on that day... This event struck me very much, especially since F. F. [Fyodor Fyodorovich] was not yet old, full of energy and did not stop working.(...) Beilstein was a bachelor, but he adopted one girl, who was the heir to his entire fortune. F. F.’s funeral was organized very solemnly, and a huge number of chemists and other scientists took part in them.”³⁴

Obituaries have been published in several chemical journals. The Russian chemist Nikolay Nikolayevich Beketov (1827-1911) published his text in *Zhurnal Russkogo fiziko-khimicheskogo obshchestva*³⁵, and the President of the French Chemical Society, the chemist Armand Gautier (1837-1920) in *Bulletin de la Société Chimique de Paris*.³⁶ The German chemist Paul Jacobson (1859-1923) wrote about Beilstein in the *Chemiker-Zeitung* in 1906.³⁷ The German chemist Otto Nikolaus Witt (1853-1915) and E. I. Hjelt published their obituaries in *Berichte der deutschen chemischen Gesellschaft*.³⁸⁻³⁹ Witt’s obituary also appeared in English in the *Journal of the Chemical Society, Transactions* in 1911.⁴⁰

Otto Lutz published his obituary in *Angewandte Chemie*.⁴¹ One of his statements about Beilstein was also quoted by Lyudmila Anatolyevna Shmulevich and the Russian historian of chemistry Yusuf Suleymanovich Musabekov (1910-1970). They wrote: “Chemistry again suffered a sensitive loss ... Died a man who did a lot for the progress of science, a man who, thanks to his peculiar talent, combined with extraordinary hard work, was able to create a work that has no equal and is intended to facilitate the work of chemists and encourage them to be creative.”⁴²

2. BEILSTEIN’S WORKS

The list of works published by him includes over one hundred and eighty articles and books that appeared in print for forty-three years from 1856 to 1899. The majority of these are the articles presenting the results of his experimental works, published in the *Zhurnal Russkogo fiziko-khimicheskogo obshchestva* in Russia, as well as in German and French journals. Among them are his original papers devoted to the problems of the of isomerism of the organic compounds, various analytical chemistry issues, and chemistry and technology of the petroleum can be found.

A large number of the results of the experimental research carried out by him were published in German in the *Justus Liebigs Annalen der Chemie, Zeitschrift für Chemie* and *Berichte der deutschen chemischen Gesellschaft*. A few his articles were published in French in the *Comptes Rendus Hebdomadaires Des Séances De L’Académie Des Sciences* and *Bulletin de la Société chimique de Paris*.

In the period from 1856 to 1882, he published, mainly from organic chemistry, the results of 152 studies. In the next, almost 25-year period from 1882 to 1906, the number of his publications was 27. A large part of all Beilstein’s works was done between 1867 and 1884 jointly with few his collaborators, such as Alfons Pavlovich Kuhlberg (1867-1873), Apollon Apollonovich Kurbatow (1874-1883), Ludwig Julievich Jawein (1879-1884) and others.⁴³

His first works in the field of organic chemistry was published in 1859 and concerned on the conversion of acetal to acetaldehyde.⁴⁴ In subsequent years, aromatic compounds were the main area of his research interests. In 1863, he and Julius Wilbrand (1839-1906) obtained para-nitrobenzoic acid by oxidation of nitrotoluene.⁴⁵

Beilstein’s research interests also focused around analytical chemistry. He devised a sensitive test, “the beautifully simple procedure now constantly employed in all

laboratories under the name of the *Beilstein test* for halogens in organic compounds.”⁴⁶ In 1872, he published it in *Zhurnal Russkogo khimicheskogo obshchestva*⁴⁷ and in *Berichte der deutschen chemischen Gesellschaft*.⁴⁸ The procedure for the *Beilstein test* was also quoted by an American chemist Eduard Farber (1892-1969) in an article published in *Isis*. Beilstein called the test “not new in principle”, since it was based on “the known [the Swedish chemist Jöns Jacob] Berzelius [(1779-1848)] reaction showing the presence of Cl, Br, I in mineral substances by means of copper oxide (...).”⁴⁹ Beilstein proposed the following variation: “A little quantity of copper oxide is brought into the ear formed in a platinum wire and fastened there by short heating to a glow. This copper oxide is then dipped into the substance, or a little of the solid material is sprinkled on, and then the wire is brought into a moderately strong flame near its lower and inner rim. At first the carbon burns and the flame is bright, right afterward the characteristic green or blue color of the flame appears.”⁵⁰

In 1867, Beilstein’s book under the title *Rukovodstvo k kachestvennomu khimicheskomu analizu* (Manual of Qualitative Chemical Analysis) was published in Russia.⁵¹ In the same year, this book was published in Germany under the title *Anleitung zur qualitativen chemischen Analyse*.⁵² The second, revised German edition was published in Leipzig in 1870,⁵³ the seventh in 1892,⁵⁴ and the last, ninth in 1909.

The Dutch edition of Beilstein “*Rukovodstvo*” appeared in 1868.⁵⁵ This book has also been published in English by William Collins, Sons, & Company in Glasgow in 1873. The book’s translator was William Ramsay.⁵⁶ In the United States this book was published in 1876 under the title *An Introduction to Qualitative Chemical Analysis*, translated from the third German edition of Beilstein “*Anleitung*” by I. J. Osburn.⁵⁷ The French edition of this book was published in 1882.⁵⁸ He was also the author of a book entitled *Lessons in Qualitative Chemical Analysis* (1883) published in Saint Louis in USA.⁵⁹ It was translated from the fifth German edition of his *Anleitung zur qualitativen chemischen Analyse* (1877) by Charles O. Curtman (1829-1896), Professor of Chemistry in the Missouri Medical College. The second edition of this book was published in 1886.⁶⁰

In 1868, he published his *Rukovodstvo k kolichestvennomu analizu* (Manual of Quantitative Analysis).⁶¹ Twenty-two years later, his book written jointly with Jawein under the title *Rukovodstvo k kachestvennomu i kolichestvennomu khimicheskomu analizu* (Manual of Quantitative and Qualitative Chemical Analysis) was published in St. Petersburg.⁶² This was the sixth, extended edition of Beilstein “*Rukovodstvo*” (1867).⁶³ The seventh edition of this book was released in 1896.⁶⁴

Beilstein is one of the first researchers in the field of chemistry and technology of Russian oil. In the first half of the 1880s, he together with the engineer A. A. Kurbatow (1851-1903) began a systematic study of the composition of the Caucasian Petroleum. Their two important papers on this topic were published in German in *Berichte der deutschen chemischen Gesellschaft*⁶⁵⁻⁶⁶. In 1883, their Russian article *Issledovaniye Kavkazskoy Nefti* was also published in *Zhurnal Russkogo fiziko-khmicheskogo obshchestva*.⁶⁷ These researchers also showed the difference between Russian and American oil.⁶⁸

From 1881, he continued his scientific activity of other nature. Instead of previous laboratory and experimental work, he began to devote almost all his energy to systematizing organic compounds.⁶⁹

The world’s first multi-volume Handbuch der organischen Chemie by Beilstein

The problem of classifying organic compounds according to their properties, methods of preparation, etc., Beilstein found very interesting during his stay in Germany. At the time, he considered writing a handbook to organic chemistry. For almost 17 years of his life, he collected information about organic compounds described in world literature. The fruit of his gigantic and independent work was the first two-volume edition entitled *Handbuch der organischen Chemie*, which was published in 1881 and 1883 in the Publishing House of Leopold Voss in Leipzig.⁷⁰ Thanks to his perseverance, it became possible to document and systematize the 15,000 organic compounds⁷¹ known at the time in these two volumes, which comprised a total of 2,201 pages.⁷²

After a few years, there was a need to expand and improve this work. Beilstein himself edited the next two editions of his *Handbuch*. The second edition (three volumes, 4,080 pages)⁷³ was published in 1886-1890,⁷⁴⁻⁷⁶ and is available in the Internet Archive. The next, third, four-volume edition, which required seven years of his work, comprised of 6,844 pages⁷⁷ and contained almost 74,000 organic compounds.⁷⁸ It was published in 1893-1899.⁷⁹ All volumes of this edition are also available on the Internet.⁸⁰⁻⁸³

The American chemist and chemical bibliographer Henry Carrington Bolton (1843-1903) was full of admiration for Beilstein’s work. He characterized his “*Handbuch*” as follows: “A stupendous monument of industrious, intelligent compilation.”⁸⁴ Pavel Ivanovich Walden (1863-1957), Ordinary Academician of the Imperial Saint Petersburg Academy of Sciences, wrote in his *Ocherk istorii khimii v Rossii* (Essay on the History of Chemistry in Russia) that “its significance and fame will survive

many generations of chemists. This is a labor that has been a prototype for other branches of chemical science and a lasting monument to energy, knowledge and diligence of its author.”⁸⁵

Supplementary volumes for the third edition of the *Handbuch der organischen Chemie* were published by the *Deutsche Chemische Gesellschaft* in 1901-1906. These were exclusively the work of Paul Jacobson and his collaborators.⁸⁶⁻⁹⁰

The Fourth Edition, including five supplements, was published from 1918-1998, covering the chemical literature through 1979. Beilstein realized from as soon as he completed the first edition that a major revision of the classification would be needed. However, he himself never felt that he had the time to complete such a reorganization of the entire work. The “Beilstein System,” the basis for the organization of the Fourth Edition, was developed by P. Jacobson, Bernhard Prager (1867-1934), and Dora Stern beginning in 1906. This classification was not subsequently changed; indeed, the stability of the Beilstein System from its origins in 1906 through the final volumes of the fifth supplement to the fourth edition in 1998 was a foundation of great usefulness of the work. The primary challenge necessitating the constant need to publish more and more supplementary volumes was the massive quantity of new research published in organic chemistry, whether it addressed novel compounds or provided additional significant information about previously known compounds.

From 1933, Friedrich Richter (1896-1961) was the director of the Beilstein editorial office and on August 1, 1951, he was appointed president of the Institute in Frankfurt am Main⁹¹ under the name *Beilstein-Institut für Literatur der organischen Chemie* (Beilstein-Institut for literature of organic chemistry), which acted as a non-profit foundation.⁹² He was followed by Hans-Günther Boit (1916-1985) in December 1961. Until 2011, the editor of *Beilstein Handbook* was Reiner Luckenbach (1941-2011), who succeeded Boit in 1978⁹³. In 1999, the name of the Institute was modified to *Beilstein-Institut zur Förderung der Chemischen Wissenschaften* (Beilstein Institute for the Advancement of Chemical Sciences).⁹⁴ In the same year, the Institut “revised and updated its constitution (...), redefining its role in the era of electronic publishing and online information systems.”⁹⁵

Richter wrote several articles about Beilstein’s *Handbuch der Organischen Chemie*. His first paper was published in *Agnewandte Chemie* in 1925.⁹⁶ His book with retrospectives on the *Handbuch* appeared thirty-two years later.⁹⁷ His other article under the title *Beilsteins Handbuch – 75 Jahre organisch-chemischer Dokumentation* was also published in *Angewandte Chemie* in 1958.⁹⁸

On the hundredth Anniversary of Beilstein’s birth, in 1938, Richter published an article in *Journal of Chemical Education*. He wrote in it: “The history of science knows no standstills and famous textbooks mark its course like milestones. When (1881-83), scarcely thirty years after Gmelin’s death, Friedrich Konrad Beilstein (1838-1906) put out the first parts of his “Handbuch der organischen Chemie,” he could not have foretold that this modest attempt, as he called it, would make his name immortal. From the two small volumes of the first edition it could not have been foreseen that eventually forty volumes would not suffice to house the total treasure trove of organic chemistry.”⁹⁹

It should be emphasized here that the German chemist Leopold Gmelin (1788-1853) became very well-known through his *Handbuch der Chemie*, whose provided a model for the kind of reference work that Beilstein compiled. After Gmelin’s death, subsequent editions of the *Handbuch der Chemie* had focused on inorganic compounds only, leading to its retitling as *Gmelins Handbuch der anorganischen Chemie*, an inorganic counterpart to Beilsteins *Handbuch* that was also edited by the *Deutsche Chemische Gesellschaft* beginning in the 1920s.

In 1981, Luckenbach and Josef Sunkel wrote an article titled *Das Wissenschaftliche Handbuch. 100 Jahre Beilstein*, which was published in *Naturwissenschaften*.¹⁰⁰ These authors about Beilstein “Handbuch” wrote: “The Beilstein’s Handbook, which in its 4th edition up to the end of 1980 reaches 225 volumes ..., covers all organic compounds described in the science literature. Together with “Gmelin’s Handbook of Inorganic Chemistry”..., which describes inorganic compounds, they cover almost the entire area of chemistry.”¹⁰¹

In 1990, the fourth edition of the *Beilstein Handbook of Organic Chemistry* consisted of over 350 printed volumes containing over 275,000 pages of text,¹⁰² and in 1998, reached a total of 503 volumes and over 440,000 pages.¹⁰³

The British historian Evan Hepler-Smith wrote on Beilstein’s *Handbuch* and his role in the development of systematic organic nomenclature in his article published in *Ambix* in 2015.¹⁰⁴

3. BIOGRAPHICAL NOTES OR BIOGRAPHIES ABOUT FRIEDRICH KONRAD BEILSTEIN PUBLISHED IN 1890-2018

In 1890, P. Alekseyev described Beilstein’s life and works in Vengerov’s Dictionary under the title *Kritiko-Biograficheskiy Slovar’ Russkikh Pisateley I Uchenykh (Ot*

Nachala Russkoy Obrazovannosti Do Nashikh Dney).¹⁰⁵ A biographical note about him was published in *Brokgauz – Yefron, Entsiklopedicheskiy Slovar'* in 1891.¹⁰⁶ Seven years later, information about him and his publications appeared in Poggenorff's *Handwörterbuch*.¹⁰⁷ In 1915, Walden¹⁰⁸⁻¹⁰⁹ published his biographical note in *Materialy Dlya Biograficheskogo Slovarya Deystvitel'nykh Chlenov Imperatorskoy Akademii Nauk*.¹¹⁰

The Russian historian of chemistry Maks Abramovich Blokh (1882-1941) presented Beilstein's biographical note in his book published in 1931.¹¹¹ Richter published two articles about him in German chemical journals in 1938.¹¹²⁻¹¹³ In the same year, Professor of Organic Chemistry at the Massachusetts Institute of Technology (MIT) (U.S.A.) Ernest H. Huntress (1899-1970) published his article about Beilstein's life and works in the *Journal of Chemical Education* in 1938.

The American chemist Henry Monmouth Smith (1868-1950) wrote Beilstein's brief biography in his book published in New York in 1949,¹¹⁵ and the British chemist and historian of chemistry James Riddick Partington (1886-1965) wrote about him in his *History of Chemistry* published in 1964.¹¹⁶ Musabekov and Shmulevich wrote about Beilstein in their article in 1969.¹¹⁷ His biographical note, written by the German chemist and historian of chemistry Otto Krätz (b. 1937), was published in *Chemie In Unserer Zeit*.¹¹⁸

The first in the world Beilstein's full-length biography was written by Shmulevich and Musabekov in 1971. In this book, the first chapter is devoted to the life of the scientist. In the second chapter of this monograph, the authors discussed the experimental research carried out by Beilstein. The third chapter describes his work on the *Handbuch der organischen Chemie*. The structure of the book also includes extensive systematic bibliography and a list of selected literature published until 1969 about Beilstein and his "Handbuch."¹¹⁹

A Beilstein's biographical note, written by the Russian chemist Feliks Kazimirovich Velichko (b. 1931), was published in 1972.¹²⁰ Luckenbach wrote about him in *Chemie In Unserer Zeit* in 1981.¹²¹

In 2004, in Göttingen, in the third edition of the publication devoted to the 300th Anniversary of Saint Petersburg appeared an article entitled *Friedrich Konrad Beilstein: Chemiker zweier Nationen* (Friedrich Konrad Beilstein: Chemist from Two Nations).¹²² Its author is the chemist and historian of natural sciences Elena Evgenievna Roussanova, candidate of chemical sciences, from St. Petersburg. She works at the *Institut für Geschichte der Naturwissenschaften, Mathematik und Technik* (Institute for the History of Science, Mathematics and Technology) at the University of Hamburg and at the *Sächsische Aka-*

demie der Wissenschaften zu Leipzig (Saxon Academy of Sciences and Humanities in Leipzig). Two years later, she wrote about Beilstein in an article published in the collection of papers of the International Conference devoted to the 145th Anniversary of the Structure Theory of Organic Compounds of A. M. Butlerov and 100th Anniversary of the Memory to F. F. Beilstein.¹²³

The American historian of science Michael D. Gordin, Professor of Modern and Contemporary History at Princeton University, wrote about Beilstein's life and work in his article published in *Chemical Heritage* in 2003,¹²⁴ and also in the chapter entitled *Beilstein Unbound: the Pedagogical Unraveling of a Man and His Handbuch* in a book edited by David Kaiser, Professor of the History of Science at MIT, which was published in MIT Press in 2005.¹²⁵ Beilstein is also discussed fairly extensively in another Gordin's book that was published by the University of Chicago Press in 2015.¹²⁶

In 2006, a books about Beilstein, written by Roussanova appeared on the 100th Anniversary of his death.¹²⁷ One year later, together with Olga Shcherbinina, she wrote an article entitled *Fridrikh Konrad Beyl'shteyn (1838-1906) - K 100 letiyu co dnya smerti russko-nemetskogo khimika* (Friedrich Konrad Beilstein (1838-1906) - On the 100th Anniversary of the Death of a Russian-German chemist).¹²⁸ In the same year, Rosussanova wrote an article about Beilstein's election to the Imperial Saint Petersburg Academy of Sciences entitled *F. K. Beilsteins Wahl in die Petersburger Akademie der Wissenschaften*.¹²⁹

Roussanova's article entitled *Friedrich Konrad Beilstein und sein Beitrag zur Kommunikation zwischen Deutschland und Russland auf dem Gebiet der Chemie* (Friedrich Konrad Beilstein and His Contribution to Communication Between Germany and Russia in the Field of Chemistry) was published in 2011.¹³⁰ One year later, David E. Lewis, professor of chemistry at the University of Wisconsin-Eau Claire (U.S.A.), briefly described Beilstein's life and selected results of his chemical works in the book entitled *Early Russian Organic Chemists and Their Legacy* in its chapters *Friedrich Konrad (Fyodor Fyodorovich) Beilstein and Beilstein's Legacy*.¹³¹ A Beilstein's biographical note, written by R. Klaus Müller, was published in 2014.¹³² Roussanova's article under the title *Sankt-Peterburgskiy khimik Fridrikh Konrad Beyl'shteyn* (St. Petersburg Chemist Friedrich Konrad Beilstein) was published in St. Petersburg in 2015 in a book edited by the German historian Dittmar Dahlmann (b. 1949) and the Russian historian Galina Ivanovna Smagina.¹³³ In 2018, Roussanova wrote about Beilstein's life and works in the first part of her book, entitled *Deutsch-russische Beziehungen in der Che-*

mie des 19. Jahrhunderts (German-Russian Relations in Chemistry in the 19th Century).¹³⁴ In the same year, the Academician of the Russian Academy of Sciences, chemist Yuri Alexandrovich Zolotov wrote about him in his book *Ocherki istorii analiticheskoy khimii* (Essays on the History of Analytical Chemistry).¹³⁵

4. LITERATURE ON BEILSTEIN'S CORRESPONDENCE

Ernest H. Huntress, in an article published in the *Journal of Chemical Education* in 1938, provided an English translation of one of Beilstein's unpublished letter to his friend August Kekulé (1829-1896), which nicely exemplifies the 22-year-old Beilstein's rather biting sense of humor.¹³⁶

Otto Krätz is the editor of the collection of correspondence between Beilstein and Emil Erlenmeyer (1825-1909), with whom he maintained close relations.¹³⁷ Roussanova's article entitled *Aspekte der deutsch-russischen Wissenschaftsbeziehungen in der Chemie in der zweiten Hälfte des 19. Jahrhunderts in Briefen des Chemikers Friedrich Konrad Beilstein* (Aspects of German-Russian Scientific Relations in Chemistry in the Second Half of the 19th Century in Letters from the chemist Friedrich Konrad Beilstein) was published in 2005.¹³⁸ One year later, she wrote an article about new sources of Beilstein's scientific correspondence.¹³⁹ Her book, published in 2007, is an edited collection of Beilstein's correspondence, an invaluable resource for those interested in his life, work, and professional and personal relationships with contemporaneous chemists. Besides the already mentioned Kekulé and Erlenmeyer, he was also in a close relationship with Jacob Volhard (1834-1910), as evidenced by his extensive correspondence.¹⁴⁰

The Russian chemist and historian of chemistry Georgiy Vladimirovich Bykov (1914-1982) was the editor of the book entitled *Pis'ma russkikh khimikov k Butlerovu* (Letters of the Russian Chemists to Butlerow), in which he included letters written, among other, by Beilstein.¹⁴¹ Together with L. M. Bekassowa he also wrote an article under the title *Beiträge zur Geschichte der Chemie der 60-er Jahre des XIX. Jahrhunderts. F. Beilstein's Briefe an A. M. Butlerow* (Contributions to the History of Chemistry of the Sixties of the XIX. Century. F. Beilstein's Letters to A. M. Butlerov), which appeared in Italy in 1966.¹⁴² At the beginning of the 1880s, Beilstein also corresponded with the Italian chemist Stanislao Cannizzaro (1826-1910).¹⁴³⁻¹⁴⁴

In 1906, Sir Henry E. Roscoe published in his autobiography an English translation of the congratulatory letter he received from his friend Beilstein on the occa-

sion of his Graduation Jubilee on April 22, 1904. A fragment of this letter is as follows:

HIGHLY HONOURED COLLEAGUE, DEAR FRIEND AND FELLOW-STUDENT, To-day, when so many of your Colleagues, Scholars, and Friends are tendering you their congratulations, you may not be unmindful of the voice of one who is far away, but who has been privileged to follow the development and outcome of your career for fully fifty years. Only a few remain from that happy time, but for that very reason their voices may have the greater weight. It was in the Winter Semester of 1853-54 that I came to Heidelberg to listen, in the class-rooms in the old cloisters, to the teaching of our revered Master, Bunsen, at the end of which Semester you took your Degree. This occurred soon after the beginning of that brilliant period of the academic activity of that immortal man which attracted the enthusiastic youth of the whole world. ... In April 1856, when I returned to Heidelberg from Munich, where I had listened to Liebig and worked with Jolly, you and I were colleagues in the new Laboratory, then just finished, and where later on you were a frequent and welcome guest. In June 1856, we—the senior pupils in Bunsen's laboratory—were photographed together. In this picture, which lies before me, I see the forms of many dear old friends who are now no more. Yes, most of them —[Johann Friedrich] Bahr [(1815-1875)], [Ludwig] Carius [(1829-1875)], Kekulé, Lothar Meyer [(1830-1895)], [Leopold von] Pebal (1826-1887)—have gone. Besides we two, our excellent and honoured comrade Landolt is the only one remaining.¹⁴⁵

The German chemist Richard Anschütz (1852-1937), professor of chemistry at the University of Bonn in the first volume of his biographical book on Kekulé, introduced the reader to Beilstein's stay in Heidelberg in the second half of the 1850s. He also posted a group photo of young chemists, which Beilstein wrote about in a letter sent to Roscoe.¹⁴⁶⁻¹⁴⁷ Memories of Beilstein's stay in Heidelberg were deeply rooted in his memory, as he also wrote about this photograph in a letter to Anschütz dated 3/16 June 1906, four months before his death. In it he wrote the correct year the photo was taken, compared to the letter he had sent to Roscoe two years earlier. He wrote, among other things: "During my entire year in Heidelberg, I dined with Kekulé daily. We all dined at the 'Darmstadt Hof' (near the end of the main street) and our society consisted of chemists, with the exception of the economist Adolf Wagner [1835-1917]. When I left at Easter 1857 we had ourselves photographed together. You probably saw this picture: in front, in the first row: Kekulé, Pebal, Carius, Bahr, Landolt, behind them: A. Wagner, [Angelo] Pavesi [(1830-1896)], [Agostino] Frapolli [(1824-1903)], Lothar Mayer, Roscoe and others, at the end me."¹⁴⁸⁻¹⁴⁹

5. CONCLUSION

Friedrich Konrad Beilstein was a great chemist of the second half of the XIX century. In the years 1880-1896, he was elected as a member of two academies of sciences and several scientific associations. He became a corresponding member of the Imperial Saint Petersburg Academy of Sciences on December 3, 1883, and he was elected an Ordinary Academician in Chemistry and Technology on December 13, 1886.¹⁵⁰ He became member of the Academy of Sciences in Göttingen in 1884, the Royal Prussian Academy of Sciences in 1888, and Academy of Science in Uppsala in 1899.¹⁵¹

Beilstein was elected as a member of the Royal Scientific Society in Göttingen in 1880. In 1883, he became an honorary member of the London Chemical Society, and two years later - *Deutsche Chemische Gesellschaft* (German Chemical Society). He was elected as an honorary member of the *Société de Médecine de Paris* (Paris Society of Medicine) (1879), the Imperial Technical Society (1888), Philadelphia Medical Society (1893), the Manchester Literary and Philosophical Society (1895) and the Imperial Technological Institute in St. Petersburg (1896).

In 1876, at the proposal of Ordinary Academicians Nikolai Nikolaevich Zinin (1812-1880)¹⁵² and Aleksandr Mikhailovich Butlerov (1828-1886),¹⁵³ the Imperial Saint Petersburg Academy of Sciences awarded him the Lomonosov Prize.

Beilstein's death did not go unnoticed. In the years 1890-2018, books and articles with his biographical notes or biographies were published in Russia, Germany, Great Britain and U.S.A. Occasional exhibitions were also organized. On October 26, 2006, the Göttingen Branch of the German Chemical Society organized an exhibition on the 100th anniversary of Beilstein's death at the *Bereichsbibliothek Chemie Niedersächsische Staats- und Universitätsbibliothek Göttingen*. On March 30, 2007, the exhibition was held in the Fundamental Library of the Technological Institute in St. Petersburg, where Beilstein worked from 1866 to 1896.¹⁵⁴

Since 2005, the *Beilstein-Institut zur Förderung der Chemischen Wissenschaften* has published the *Beilstein Journal of Organic Chemistry* "to provide unrestricted access to high-quality scientific information in the field of organic chemistry."¹⁵⁵

The name of Beilstein is associated with his *Handbuch* and research in organic synthesis. The results of his experimental studies have been published in scientific journals in Germany, France and Russia. The Imperial Technological Institute where he worked for thirty years was completed by about 1,000 technologists chemists, who, through their work, have made a great contribution to the development of chemical science.¹⁵⁶

Shmulevich and Musabekov, the authors of Beilstein's biography, wrote about the immortality of his name as follow: "The greatest popularity comes to a scientist when his own name becomes widely known: his name, for example, is called a unit of measurement - and write it without a capital letter - or any edition. In other words, the name is transferred to an inanimate object. This happened with a native of Russia, St. Petersburg academician Fyodor Beilstein, so famous among chemists all over the world. When the word "Beilstein" is spoken, the chemist's imagination is not a man with a thick beard and a handsome, typically learned appearance, but a multivolume handbook, where you can quickly find the information you need about any of the myriad organic compounds."¹⁵⁷

This outstanding Russian-German chemist took forever a well-defined place in the history of chemistry. His name and the name of Gmelin¹⁵⁸ are associated with the *Gmelin-Beilstein-Denkünze* (Gmelin-Beilstein Memorial Medal) award. It is awarded biennially by the *Gesellschaft Deutscher Chemiker* (German Chemical Society) since 1954, to domestic and foreign "individuals have produced outstanding contributions to the history of chemistry, chemical literature or chemical information."¹⁵⁹ The prize-winning *Gmelin-Beilstein-Denkünze* receives a silver medal, certificate and accompanying prize of € 7,500.¹⁶⁰

REFERENCES

1. H. C. Bolton, *Science, New Series*. **1899**, 10(259), p. 869. <http://doi.org/10.1126/science.10.259.865>
2. L. A. Shmulevich, Yu. S. Musabekov, *Fedor Fedorovich Beil'shtein (1834 - 1906)*, Izdatel'stvo "Nauka", Moskva, **1971**, p. 65 (in Russian).
3. See ref. 2 (Shmulevich, Musabekov), p. 7.
4. E. Roussanova, O. Shcherbinina, *Fridrikh Konrad Beyl'shteyn (1838-1906) - K 100 letiyu co dnya smerti russko-nemetskogo khimika*. Sankt-Peterburg. **2007**, p. 48. (in Russian). Retrieved from <https://www.math.uni-hamburg.de/home/roussanova/----Russisch-Beilstein-Alles>
5. E. H. Huntress, *J. Chem. Educ.* **1938**, 15(7), p. 303. <https://doi.org/10.1021/ed015p303>
6. Fr. Beilstein, *Justus Liebigs Ann. Chem.* **1856**, 99(2), 165-197. <https://doi.org/10.1002/jlac.18560990203>
7. Fr. Beilstein, *Justus Liebigs Ann. Chem.* **1858**, 107(2), 176-191. <https://doi.org/10.1002/jlac.18581070206>
8. Fr. C. Beilstein aus Russland, *Ueber das Murexid*. Inaugural-Dissertation zur Erlangung der Philosophischen-Doctor-Würde, Dieterich, Göttingen **1858**.

9. See ref. 5 (Huntress), p. 303.
10. P. I. Walden in *Materialy dlya biograficheskogo slovarya deystvitel'nykh chlenov Imperatorskoy Akademii Nauk, Ch.1: A-L* (Materials for the Biographical Dictionary of Full Members of the Imperial Academy of Sciences, Part 1: A-L.), Tipografiya Imperatorskoy Akademii Nauk, Petrograd, **1915**, p. 26 (in Russian). Retrieved from Elektronnaya biblioteka BELINKI website: <http://elib.uraic.ru/handle/123456789/34011>
11. See ref. 10 (Walden), p. 25.
12. P. Alekseyev in *Kritiko-Biograficheskiy Slovar' Russkikh Pisateley I Uchenykh (Ot Nachala Russkoy Obrazovanosti Do Nashikh Dney)*. T. 2, vyp. 22-30 (Critical and Biographical Dictionary of Russian Writers and Scientists (From the Beginning of Russian Education to the Present Day)). T. 2, No. 22-30. (Ed.: S. A. Vengerov), Semenovskaya Tipolitografiya (I. A. Yefrona), Sankt-Peterburg, **1890**, p. 347 (in Russian). Retrieved from Elektronnaya Biblioteka BELINKI website: <http://elib.uraic.ru/handle/123456789/16219>
13. See ref. 10 (Walden), p. 25.
14. F. F. Beil'shtein, A. K. Krupskiy, *Fabrichnaya khimicheskaya promyshlennost' zapadno-yevropeyskikh stran na vsemirnoy vystavke v Vene 1873 goda*. Sankt-Peterburg, **1874**.
15. F. Beilstein, *Die chemische Grossindustrie auf der Weltaustellung zu Wien im Jahre 1873*, Verlag Von Quandt und Händel, Leipzig, **1873**.
16. Quoted in ref. 2 (Shmulevich, Musabekov), p. 65.
17. See ref. 10 (Walden), p. 26.
18. *200th Anniversary of Berlin Academy*. **1900**. Public Domain. Retrieved from Wikimedia Commons website: https://commons.wikimedia.org/wiki/Category:Portrait_photographs_of_Dmitri_Mendeleev#/media/File:200_y_Anniversary_of_Berlin_Academy_1900.jpg
19. B. Harrow, *Eminent Chemists of Our Time*, D. Van Nostrand Company, New York, **1920**, p. 8. Retrieved from <https://archive.org/details/eminentchemistso00harrooft/page/n7/mode/2up?q=>
20. F. G. Donnan, *Obituary Notices of Fellows of the Royal Society*, **1948**, 5(16), 666-687. Retrieved from <http://www.jstor.org/stable/768764>
21. Obituary. *Ber. Dtsch. Chem. Ges.* **1912**, 45(3), 3597-3644. <https://doi.org/10.1002/cber.191204503118>
22. G. B. Kauffman, *Platinum Metals Rev.* **1992**, 36(4), 217-223. Retrieved from <https://www.technology.matthey.com/article/36/4/217-223/>
23. G. B. Kauffman, L. NiiNistö, *Chem. Educat.* **1998**, 3, 1-16. <https://doi.org/10.1007/s00897980208a>
24. R. Pribram, *Ber. Dtsch. Chem. Ges.* **1911**, 44(3), 3337-3394. <https://doi.org/10.1002/cber.191104403209>
25. K. Volke, *Chem. Unserer Zeit.* **2004**, 38(5), 360-361. <https://doi.org/10.1002/ciuz.200490078>
26. A. E. H. Tutton, *Nature.* **1925**, 115 (2888), 343-345. <https://doi.org/10.1038/115343a0>
27. Jacobus H. van't Hoff, Biographical in *Nobel Lectures Chemistry 1901-1921*, Elsevier Publishing Company, Amsterdam, **1966**. Retrieved from The Nobel Prize website: <https://www.nobelprize.org/prizes/chemistry/1901/hoff/biographical/>
28. T. C. Chaudhuri, *Sir William Ramsay as a Scientist and Man*, Medical Publishers, Calcutta, **1918**. Retrieved from <https://archive.org/details/sirwilliamramsay00chauoft>
29. A. Szejnberg, *Rev. CENIC Cienc. Quím.* **2018**, 49, 1-13. Retrieved from <https://ojs3.cnice.cu/index.php/RevQuim/article/view/224>
30. G. Boeck, R. Zott, *Chem. Unserer Zeit.* **2007**, 41(1), 12-20. <http://doi.org/10.1002/ciuz.200700406>
31. Adolf von Baeyer, Biographical in *Nobel Lectures Chemistry 1901-1921*, Elsevier Publishing Company, Amsterdam, **1966**. Retrieved from The Nobel Prize website: <https://www.nobelprize.org/prizes/chemistry/1905/baeyer/biographical/>
32. G. B. Kauffman, E. Molayem, *Ambix*, **1990**, 37(1), 20-34. <http://doi.org/10.1179/amb.1990.37.1.20>
33. See ref. 2 (Shmulevich, Musabekov), p. 68.
34. V. N. Ipatiev, *Zhizn' Odnogo Khimika. Vospominaniya. Tom. 1:1867-1917*, Opublikovano avtorom, N'yu-York [The Life of One Chemist. Memories. Vol. 1: 1867-1917, Published by the author, New York], **1945**, p. 319. (in Russian). Retrieved from https://vtoraya-literatura.com/pdf/ipatiev_zhizn_odnogo_khimika_vospominaniya_tom1_1945_text.pdf
35. N. N. Beketov, *Zh. Russ. Fiz.-Khim. O-va.* **1906**, 38, 1279-1280.
36. A. Gautier, *Bull. Soc. Chim.* **1906**, pp. I-III. Retrieved from <https://gallica.bnf.fr/ark:/12148/bpt-6k5499755m/f1389.item.r=>
37. P. Jacobson, *Chemiker-Zeitung*, **1906**, 86.
38. O. N. Witt, *Ber. Dtsch. Chem. Ges.* **1906**, 39(4), 3551-3555. <https://doi.org/10.1002/cber.19060390402>
39. E. Hjelt, *Ber. Dtsch. Chem. Ges.* **1907**, 40(4), 5041-5078. <https://doi.org/10.1002/cber.190704004180>
40. O. N. Witt, *J. Chem. Soc., Trans.* **1911**, 99, 1646-1649. <https://doi.org/10.1039/CT9119901646>
41. O. Lutz, *Angew. Chem.* **1906**, 19(50), 2058-2060. <https://doi.org/10.1002/ange.19060195004>
42. Quoted in ref. 2 (Shmulevich, Musabekov), p. 68.
43. See ref. 10 (Walden), p. 26.
44. Fr. Beilstein, *Compt. Rend.* **1859**, 48, 1121-1122. Retrieved from <https://gallica.bnf.fr/ark:/12148/bpt6k30054/f1117.item.r>

45. J. Wilbrand, F. Beilstein, *Justus Liebigs Ann. Chem.* **1863**, 128(3), 257-273. <https://doi.org/10.1002/jlac.18631280302>
46. Quoted in ref. 5 (Huntress), p. 306.
47. F. Beil'shtein, *Zh. Russ. Khim. O-va.* **1872**, 4, 308, 358-359.
48. F. Beilstein, *Ber. Dtsch. Chem. Ges.* **1872**, 5(2), 620-621. <https://doi.org/10.1002/cber.18720050209>
49. Quoted in E. Farber, *Isis*, **1970**, 61(3), p. 383. Retrieved from <http://www.jstor.com/stable/229689>
50. Quoted in ref. 49 (Farber), p. 383.
51. F. Beil'shtein, *Rukovodstvo k kachestvennomu khimicheskomu analizu*, Tipografiya Tovarishchestva Obshchestvennaya Pol'za, Sankt-Peterburg, **1867** (in Russian). Retrieved from Elektronnaya biblioteka GPNTB Rossii website: http://193.233.14.50/reader/flipping/Resource-895/Beyl--shteyn_F_Rukovodstvo_kachestvennomu_khimicheskomu_analizu/index.html
52. M. D. Gordin, *Isis*, **2012**, 103, p. 91. <http://dx.doi.org/10.1086/664980>
53. F. Beilstein, *Anleitung zur qualitativen chemischen Analyse*. Zweite Umgearbeitete Auflage. Verlag Von Quandt & Händel, Leipzig, **1870**. Retrieved from <https://goobi.tib.eu/viewer/image/837318343/6/>
54. H. C. Bolton, *A select bibliography of chemistry, 1492-1892*, Smithsonian Institution, City of Washington, **1893**, p. 1171. Retrieved from <https://archive.org/details/selectbibliograp00boltooft/page/1212/mode/2up>
55. F. Beilstein, *Inleiding Tot De Qualitatieve Chemische Analyse*. (H. IJssel de Scheppe, Trans.), Bij G. Brouwer, Te Deventer, **1868**. Retrieved from <https://books.google.pl/books?id=60C9EpX3IkAC&printsec=frontcover&hl>
56. F. Beilstein, *A Manual of Qualitative Chemical Analysis*. (W. Ramsay, Trans.), William Collins, Sons, & Company, London, Glasgow, **1873**. Retrieved from <https://archive.org/details/b21497242/page/n5/mode/2up>
57. F. Beilstein, *An Introduction to Qualitative Chemical Analysis*. (I. J. Osbun, Trans.), Van Nostrand, New York, **1876**.
58. F. Beilstein, *Manuel D'Analyse Chimique Qualitative*. (A. Buisine, P. Buisine, Trans.), Elie Masson, Lille, **1882**. Retrieved from <https://gallica.bnf.fr/ark:/12148/bpt6k3067731c>
59. F. Beilstein, *Lessons in Qualitative Chemical Analysis* (C.O. Curtman, Trans.), St. Louis Stationery & Book Co., Saint Louis (Mo.). **1883**. Retrieved from <https://archive.org/details/b21498532/page/n5/mode/2up>
60. See ref. 54 (Bolton), p. 385.
61. F. Beil'shtein, *Rukovodstvo k kolichestvennomu analizu*, Tipografiya Tovarishchestva Obshchestvennaya Pol'za, St. Petersburg, **1868** (in Russian).
62. F. Beil'shtein, L. Yu. Jawein, *Rukovodstvo k kachestvennomu i kolichestvennomu khimicheskomu analizu*, St. Petersburg, **1890**.
63. A. K. Krupskiy, *Russkaya Chast' Khimicheskoy Bibliografii (Dolozheno v zasedanii fiziko-matematicheskogo otdeleniya 5-go Oktyabrya 1896 g.)* (The Russian Part of the Chemical Bibliography: (Reported at a Meeting of the Physics and Mathematics Department on October 5, 1896), Tipografiya Imperatorskoy Akademii Nauk, Sankt-Peterburg, **1900**, p. 4 (in Russian). Retrieved from Elektronnaya biblioteka BELINKI website: <http://elib.uraic.ru/handle/123456789/16183>
64. H.C. Bolton, *A Select Bibliography of Chemistry 1492-1897. First Supplement*, Smithsonian Institution, City of Washington, **1899**, p. 228. Retrieved from <https://archive.org/details/selectbibliograp01boltooft/page/ii/mode/2up>
65. F. Beilstein, A. Kurbatow, *Ber. Dtsch. Chem. Ges.* **1880**, 13(2), 1818-1821. <https://doi.org/10.1002/cber.188001302143>
66. F. Beilstein, A. Kurbatow, *Ber. Dtsch. Chem. Ges.* **1881**, 14(2), 1620-1622. <https://doi.org/10.1002/cber.18810140211>
67. F. F. Beil'shtein, A. A. Kurbatov, *Zh. Russ. Fiz.-Khim. O-va.* **1883**, 15, 5-32.
68. F. Beilstein, A. Kurbatow, *Ber. Dtsch. Chem. Ges.* **1880**, 13(2), 2028-2029. <https://doi.org/10.1002/cber.188001302182>
69. See ref. 10 (Walden), p. 26.
70. S. Zamecki, *Kwartalnik Historii Nauki i Techniki*, **1974**, 19(1), p. 163 (in Polish). Retrieved from <http://bazhum.muzhp.pl/czasopismo/6/?idno=5951>
71. F. Richter, *J. Chem. Educ.* **1938**, 15(7), p. 311. <https://doi.org/10.1021/ed015p310>
72. P. Jacobson, *Naturwissenschaften*, **1919**, 7, p. 223. <https://doi.org/10.1007/BF01591603>
73. S. R. Heller in *The Beilstein Online Database. Implementation, Content, and Retrieval*, (Ed.: S. R. Heller), American Chemical Society, Washington, DC, **1990**, p. 2. Retrieved from <https://pubs.acs.org/doi/pdf/10.1021/bk-1990-0436.ch001>
74. F. Beilstein, *Handbuch der organischen Chemie*, Zweite, Gänzlich Umgearbeitete Auflage. Erster Band. Verlag von Leopold Voss, Hamburg, Leipzig, **1886**. Retrieved from <https://archive.org/details/handbuchderorgan01abeil/>
75. F. Beilstein, *Handbuch der organischen Chemie*, Zweite, Gänzlich Umgearbeitete Auflage. Zwieter Band. Verlag von Leopold Voss, Hamburg, Leipzig, **1888**. Retrieved from <https://archive.org/details/handbuchsderorgan02beil/>

76. F. Beilstein, *Handbuch der organischen Chemie*, Zweite, Gänzlich Umgearbeitete Auflage. Dritter Band. Verlag von Leopold Voss, Hamburg, Leipzig, **1890**. Retrieved from <https://archive.org/details/handbuchderorgan03beil>
77. See ref. 72 (Jacobson), p. 223.
78. E. Roussanova, *Mitteilungen Fachgruppe Geschichte der Chemie (Frankfurt/Main), Gesellschaft Deutscher Chemiker*. **2007**, 19, p. 257. Retrieved from https://www.gdch.de/fileadmin/downloads/Netzwerk_und_Strukturen/Fachgruppen/Geschichte_der_Chemie/Mitteilungen_Band_19/2007-19-18.pdf
79. See ref. 10 (Walden), p. 26.
80. F. Beilstein, *Handbuch der organischen Chemie*, Dritte, Umgearbeitete Auflage. Erster Band. Verlag von Leopold Voss, Hamburg, Leipzig, **1893**. Retrieved from <https://archive.org/details/handbuchderorgan01beil/page/n3/mode/2up>
81. F. Beilstein, *Handbuch der organischen Chemie*, Dritte, Umgearbeitete Auflage. Zweiter Band. Verlag von Leopold Voss, Hamburg, Leipzig, **1896**. Retrieved from <https://archive.org/details/handbuchderorgan02abeil>
82. F. Beilstein, *Handbuch der organischen Chemie*, Dritte, Umgearbeitete Auflage. Dritter Band. Verlag von Leopold Voss, Hamburg, Leipzig, **1897**. Retrieved from <https://archive.org/details/handbuchsderorga03abeil/page/n5/mode/2up>
83. F. Beilstein, *Handbuch der Organischen Chemie*, Dritte Umgearbeitete Auflage, Viertes Band, Verlag Von Leopold Voss, Hamburg und Leipzig, **1899**. Retrieved from Spravochnik Beil'shteina website: <http://chemistry-chemists.com/chemister/Spravochnik-Beilstein/Beilsteins-Handbuch0-04-1899.djvu>
84. Quoted in ref. 10 (Walden), p. 27.
85. P. I. Walden, *Ocherk istorii khimii v Rossii* in A. Ladenburg, *Lektsii po Istorii Razvitiya Khimii ot Lavuaz'ye do nashego vremeni* (Lectures on the History of the Development of Chemistry from Lavoisier to Our Time), Perevod s 4-go izdaniya. (Ye. S. Yel'chaninov, Trans.), Mathesis, Odessa, **1917**, p. 421. (in Russian). Retrieved from <http://193.233.14.50/reader/flipping/Resource-157/ladenburg-a-lekci-po-teorii-razvitiya-himii-ot-lavuaz-e-do-nashego-vremeni/index.html>
86. F. Beilstein, *Ergänzungsbände Zur Dritten Auflage des Handbuchs der organischen Chemie*. Redigiert von Paul Jacobson. Erster Ergänzungsbänd, Eigentum Der Deutschen Chemischen Gesellschaft, Verlag von Leopold Voss, Hamburg, **1901**. Retrieved from <https://archive.org/details/handbuchsderorga01beil/page/n5/mode/2up>
87. F. Beilstein, *Ergänzungsbände Zur Dritten Auflage des Handbuchs der organischen Chemie*. Redigiert von Paul Jacobson. Zweiter Ergänzungsbänd, Eigentum Der Deutschen Chemischen Gesellschaft, Verlag von Leopold Voss, Hamburg, **1903**. Retrieved from <https://archive.org/details/handbuchderorgan02beil/page/n5/mode/2up>
88. F. Beilstein, *Ergänzungsbände Zur Dritten Auflage des Handbuchs der organischen Chemie*. Redigiert von Paul Jacobson. Dritter Ergänzungsbänd, Eigentum Der Deutschen Chemischen Gesellschaft, Verlag von Leopold Voss, Hamburg, **1904**. Retrieved from <https://archive.org/details/handbuchsderorga03beil>
89. F. Beilstein, *Ergänzungsbände Zur Dritten Auflage des Handbuchs der organischen Chemie*. Redigiert von Paul Jacobson. Viertes Ergänzungsbänd, Eigentum Der Deutschen Chemischen Gesellschaft, Verlag von Leopold Voss, Hamburg, **1906**. Retrieved from <https://archive.org/details/handbuchsderorga04beil/page/n5/mode/2up>
90. F. Beilstein, *Ergänzungsbände Zur Dritten Auflage des Handbuchs der organischen Chemie*. Redigiert von Paul Jacobson. Fünfter Ergänzungsbänd, Eigentum Der Deutschen Chemischen Gesellschaft, Verlag von Leopold Voss, Hamburg, **1906**. Retrieved from <https://archive.org/details/handbuchsderorga05beil>
91. H. Götze, *Springer-Verlag. History of a Scientific Publishing House. Part 2:1945-1992. Rebuilding, Opening Frontiers, Securing the Future*. (M. Schäfer, Trans.), Springer-Verlag, Berlin, Heidelberg, **1996**, p. 53.
92. *Beilstein Institut*. **2020**. History. p. 1. Retrieved from Beilstein Institute website: <https://www.beilstein-institut.de/en/about-us/history/>
93. See ref. 73 (Heller), p. 2.
94. C. Kettner, *Die Geschichte des Beilstein-Instituts*. **2007**, p. 18. Retrieved from https://web.archive.org/web/20170320144203/https://www.chemie.uni-hamburg.de/bibliothek/Institutsgeschichte_Beilstein.pdf
95. Quoted in ref. 91 (Beilstein Institut), p. 1.
96. F. Richter, *Angew. Chem.* **1925**, 38(48), 1096-1098. <https://doi.org/10.1002/ange.19250384807>
97. F. Richter, *75 Jahre Beilsteins Handbuch Der Organischen Chemie: Aufsätze Und Reden*, Springer, Berlin, **1957**.
98. F. Richter, *Agnew. Chem.* **1958**, 70(10), 279-284. <https://doi.org/10.1002/ange.19580701002>
99. Quoted in ref. 71 (Richter), p. 310.
100. R. Luckenbach, J. Sunkel, *Naturwissenschaften*, **1981**, 68(2), 53-55. <https://doi.org/10.1007/BF01047222>
101. Quoted in ref. 100 (Luckenbach, Sunkel), p. 53.
102. See ref. 73 (Heller), p. 1.
103. See ref. 94 (Kettner), p. 17.
104. E. Hepler-Smith, *Ambix*, **2015**, 62(1), 1-28. <https://doi.org/10.1179/1745823414Y.0000000006>

105. See ref. 12 (Alekseyev), pp. 346-351.
106. I. Ye. Andreyevskiy (Ed.), *Brokgauz - Yefron, Entsiklopedicheskiy Slovar'* (Brockhaus - Efron, Encyclopedic Dictionary), t. III., Semenovskaya Tipo Litografiya (I. A. Yefrona), St. Peterburg. **1891**, pp. 327-328 (in Russian). Retrieved from Rossiyskaya Gosudarstvennaya Biblioteka Onlayn website: <https://dlib.rsl.ru/viewer/01003924255#?page=338>
107. J. C. Poggendorff, *Biographisch-Literarisches Handwörterbuch zur Geschichte Der Exacten Wissenschaften*. Dritter Band (1858-1883). Herausgegeben von B.W. Feddersen und A. J. von Oettingen. I. Abtheilung (A-L), Verlag von Johann Ambrosius Barth, Leipzig, **1898**, pp. 96-97. Retrieved from https://archive.org/details/bub_gb_jgcjAQAAMAAJ/page/n107/mode/2up
108. Val'den Pavel (Paul') Ivanovich (latysh. Pauls Valdens / nem. Paul Walden). **2017**. Retrieved from Arkhiviy Rossiyskoy Akademii Nauk website: <http://isaran.ru/?q=ru/person&guid=ECE36A00-C62E-C451-34C2-226AE6BBE6AD&str>
109. G. Boeck, *ChemText*, **2019**, 5(6), 1-7. <https://doi.org/10.1007/s40828-019-0080-9>
110. See ref. 10 (Walden), pp. 24-31.
111. M. A. Blokh, *Biograficheskiy spravochnik. Vydayushchiesya khimiki i uchenyye XIX i XX stoletii, rabotavshiyeye v smezhnykh s khimiiyeyu oblastyakh nauki Tom II* (Biographical Reference Book. Outstanding Chemists and Scientists of the Nineteenth and Twentieth Centuries, Working in Areas of Science Adjacent to Chemistry), Lenkhimsektor, Leningrad, **1931**, pp. 39-40 (in Russian). Retrieved from <http://books.e-heritage.ru/book/10073686>
112. F. Richter, *Ber. Dtsch. Chem. Ges.* **1938**, 71(2), A35-A55. <https://doi.org/10.1002/cber.19380710250>
113. F. Richter, *Agnew. Chem.* **1938**, 51(7), 101-107. <https://doi.org/10.1002/ange.19380510702>
114. See ref. 5 (Huntress), pp. 303-309.
115. H. M. Smith, *Torchbearers of Chemistry. Portraits and Brief Biographies of Scientists Who Have Contributed to the Making of Modern Chemistry*, Academic Press, Inc., Publishers, New York, **1949**, p. 26.
116. J. R. Partington, *A History of Chemistry. Volume Four*, Macmillan & Company Limited, London, **1964**, pp. 797-798.
117. Yu. S. Musabekov, L. A. Shmulevich, *Voprosy Istorii Yestestvoznaniya i Tekhniki AN SSSR.* **1969**, 3(28), 61-68 (in Russian).
118. O. Krätz, *Chem. Unserer Zeit.* **1970**, 4(4), 115-119. <https://doi.org/10.1002/ciuz.19700040404>
119. See ref. 2 (Shmulevich, Musabekov) for details.
120. F. K. Velichko, *Priroda*, **1972**, 8, 118-120. Retrieved from <https://www.twirpx.com/file/1117980/>
121. R. Luckenbach, *Chem. Unserer Zeit.* **1981**, 15(2), 47-51. <https://doi.org/10.1002/ciuz.19810150204>
122. E. Roussanova in *Russland und die "Göttingische Seele". 300 Jahre St. Petersburg. Ausstellung in der Paulinerkirche Göttingen unter der Schirmherrschaft von Bundespräsident Johannes Rau und dem Präsidenten der Russischen Föderation Wladimir Putin* (Russia and the "Göttingen Soul". 300 Years of St. Petersburg. Exhibition in the Paulinerkirche Göttingen under the Patronage of Federal President Johannes Rau and the President of the Russian Federation Vladimir Putin). Herausgegeben von Elmar Mittler und Silke Glitsch, 3., erneut durchgesehene Auflage, Universitätsverlag Göttingen, Göttingen, **2004**, pp. 405-430. <https://doi.org/10.17875/gup2004-367>
123. E. Roussanova, *F. K. Beilstein and his Contribution in International Scientific Relations, especially Russian-German*. "Organic chemistry since Butlerov and Beilstein until present": International Conference devoted to the 145th anniversary of the structure theory of organic compounds of A. M. Butlerov and 100th anniversary of the memory to F. F. Beilstein, St. Petersburg, 26.-29.6. **2006**, pp. 25-38.
124. M. D. Gordin, *Chem. Heritage*, **2003/4**, 21(4), pp. 10-11, 32-36.
125. M. D. Gordin in *Pedagogy and the Practice of Science: Historical and Contemporary Perspectives*, (Ed.: D. Kaiser), MIT Press, Cambridge, MA, **2005**, pp. 11-39.
126. M. D. Gordin, *Scientific Babel: How Science was Done Before and After Global English*, University of Chicago Press, Chicago, **2015**.
127. E. Roussanova, „Deshalb ist mir um meinen Ruhm nicht bange ...“. *Zum 100. Todestag des deutsch-russischen Chemikers Friedrich Konrad Beilstein (1838-1906). Begleitheft zur Ausstellung in der Bereichsbibliothek Chemie (BBN) der Niedersächsischen Staats- und Universitätsbibliothek Göttingen vom 26. Oktober bis 27. November 2006 und in der Bibliothek des Departements Chemie der Universität Hamburg vom 8. bis 22. Dezember 2006*, Books on Demand GmbH, Hamburg, Norderstedt, **2006**.
128. See ref. 4 (Roussanova, Shcherbinina) for details.
129. E. Roussanova, *Mitteilungen Fachgruppe Geschichte der Chemie (Frankfurt/Main), Gesellschaft Deutscher Chemiker.* **2007**, 19, 107-132. Retrieved from https://www.gdch.de/fileadmin/downloads/Netzwerk_und_Strukturen/Fachgruppen/Geschichte_der_Chemie/Mitteilungen_Band_19/2007-19-09.pdf
130. E. Roussanova in *Naturwissenschaft als Kommunikationsraum. Internationale Tagung, Leipzig, 29.9.-*

- 1.10.2010, (Eds.: O. Riha, M. Fischer), Shaker Verlag GmbH, Aachen, **2011**, pp. 75-96.
131. D. E. Lewis, *Early Russian Organic Chemists and Their Legacy*, Springer, Heidelberg, New York, Dordrecht, London, **2012**.
132. K. Müller in *Important Figures of Analytical Chemistry from Germany in Brief Biographies. From the Middle Ages to the Twentieth Century*, (D. T. Burns, R. K. Müller, R. Salzer, G. Werner), Springer, Cham, Heidelberg, New York, Dordrecht, London, **2014**, pp. 69-70. <http://dx.doi.org/10.1007/978-3-319-12151-2>
133. E. Roussanova in *Nemtsy v Rossii. Nemetskiy Mir Sankt-Peterburga* (Germans in Russia. German World of St. Petersburg), (Eds.: D. Dahlmann; G. I. Smagina), Rostok, Sankt-Peterburg, **2015**, pp. 272-300. (in Russian).
134. E. Roussanova, *Deutsch-russische Beziehungen in der Chemie des 19. Jahrhunderts. Erster Teil. Bibliographien*, Shaker Verlag GmbH, Aachen, **2018**, pp. 146-172.
135. Yu. A. Zolotov, *Ocherki istorii analiticheskoy khimii* (Essays on the History of Analytical Chemistry), Tehnosfera, Moskva, **2018** (in Russian).
136. See ref. 5 (Huntress), pp. 303-305.
137. O. Krätz (Ed.), *Beilstein – Erlenmeyer. Briefe zur Geschichte der chemischen Dokumentation und des chemischen Zeitschriftenwesens*, W. Fritsch Verlag, München, **1972**.
138. E. Roussanova in *Deutsche im Zarenreich und Russen in Deutschland: Naturforscher, Gelehrte, Ärzte und Wissenschaftler im 18. und 19. Jahrhundert. Vorträge des Symposiums vom 26. und 27. August 2004 am Karl-Sudhoff-Institut für Geschichte der Medizin und der Naturwissenschaften*, (Eds.: I. Kästner, R. Pfrepper), Medizinische Fakultät der Universität Leipzig, Band 12., Shaker Verlag GmbH, Aachen, **2005**, pp. 227-272.
139. E. Roussanova, *Friedrich Konrad Beilstein (1838-1906): Scientific Correspondence of F. K. Beilstein: New Sources*. “Organic chemistry since Butlerov and Beilstein until present”: International Conference devoted to the 145th anniversary of the structure theory of organic compounds of A. M. Butlerov and 100th anniversary of the memory to F. F. Beilstein, St. Petersburg, 26.-29.6. **2006**, pp. 822-829.
140. E. Roussanova, *Friedrich Konrad Beilstein—Chemiker zweier Nationen: Sein Leben und Werk sowie einige Aspekte der deutsch-russischen Wissenschaftsbeziehungen in der zweiten Hälfte des 19. Jahrhunderts im Spiegel seines brieflichen Nachlasses. Band II. Briefe und Dokumente*. (Friedrich Konrad Beilstein — Chemist of Two Nations: His Life and Work as well as Some Aspects of the German-Russian Scientific Relationship in the Second Half of the 19th Century in the Mirror of His Letters. Volume II. Letters and Documents). Books on Demand GmbH, Hamburg, Norderstedt, **2007**.
141. G. V. Bykov (Ed.), *Pis'ma russkikh khimikov k A. M. Butlerovu* (Letters of Russian chemists to A. M. Butlerov), Nauchnoye nasledstvo, t. 4, Izdatel'stvo Akademii Nauk SSSR, Moskva, **1961**, pp. 33-51.
142. G. W. Bykow, L. M. Bekassowa, *Physis. Rivista Internazionale di Storia della Scienza*, **1966**, 8, 267-285.
143. See ref. 129 (Roussanova), p. 117.
144. D. Marotta (Ed.), Stanislao Cannizzaro. *Scritti Vari E Lettere Inedite Nel Centenario Della Nascita* (Various Writings and Unpublished Letters on the Centenary of His Birth), Associazione Italiana Di Chimica Generale Ed Applicata, Tip. Leonardo Da Vinci, Roma, **1926**, pp. 325-326.
145. H. E. Roscoe, *The Life & Experiences of Sir Henry Enfield Roscoe, D.C.L., LL.D., F.R.S. Written by Himself*, Macmillan And CO., Limited, London, New York, **1906**, pp. 414-415. Retrieved from <https://archive.org/details/lifeexperienceso00roscrich/page/n7/mode/2up>
146. R. Anschütz, *August Kekulé. Band I, Leben und Werken*, Verlag Chemie, G.M.B.H., Berlin, **1929**, p. 64. Retrieved from https://archive.org/details/b29931654_0001/page/n3/mode/2up
147. *Ficheiro: AK Bunsen-Heidelberg 1857.jpg*. **n.d.** Retrieved from https://pt.m.wikipedia.org/wiki/Ficheiro:AK_Bunsen-Heidelberg_1857.jpg
148. See ref. 4 (Roussanova, Shcherbinina), pp. 9, 49.
149. See ref. 135 (Roussanova) for details.
150. *Beil'shtein Fedor Fedorovich (Fridrikh Konrad) (Friedrich Konrad Beilstein)*, **2017**, (in Russian). Retrieved from Arkhivy Rossiyskoy akademii nauk website: <http://isaran.ru/?q=ru/person&guid=F51DD901-0609-C7E0-EEB5-2A70E3104401&str=>
151. See ref. 10 (Walden), p. 27.
152. A. Sztejnberg, *Rev. CENIC Cienc. Quím.* **2019**, 50(1), 90–102. Retrieved from <https://ojs3.cnic.cu/index.php/RevQuim/article/view/297>
153. B. Halton, *Chem. N. Z.* **2018**, 82(1), 46-52. Retrieved from <https://nzic.org.nz/app/uploads/2018/07/CiNZ-Jan-2018-min.pdf>
154. See ref. 78 (Roussanova), pp. 257-261.
155. *Beilstein Journal of Organic Chemistry*. **2020**. (Second paragraph). Retrieved from Beilstein-Institut website: <https://www.beilstein-institut.de/en/publications/organic-chemistry/>
156. *Fedor Fedorovich Beil'shtein (05.02.1838 – 05.10.1906)*. **2015**. Retrieved from WEB-MUZEY

- Sankt-Peterburgskogo Gosudarstvennogo Tekhnologicheskogo Instituta website: <https://museum-spbt.wixsite.com/museum/belstein>
157. Quoted in ref. 2 (Shmulevich, Musabekov), p. 5.
158. P. Stumm, *Leopold Gmelin (1788-1853). Leben und Werk eines Heidelberger Chemikers*, Centaurus Verlag & Media UG, Freiburg, **2012**.
159. J. Gregor, *Gmelin-Beilstein medal will be awarded to Guillermo Restrepo*. Max-Planck-Institut für Mathematik in den Naturwissenschaften (MPIMIS). **2020**. Retrieved from <https://nachrichten.idw-online.de/2020/02/27/gmelin-beilstein-medal-will-be-awarded-to-guillermo-restrepo/>
160. J. Herr, *Gmelin-Beilstein-Denkmünze*. **2020**. Retrieved from the Gesellschaft Deutscher Chemiker website: <https://www.gdch.de/gdch/preise-und-auszeichnungen/gdch-preise/gmelin-beilstein-denkmuenze.html>
- Ueber die Umwandlung des Acetals zu Aldehyd. Justus Liebigs Ann. Chem. 112(2), 239-240. <https://doi.org/10.1002/jlac.18591120218>; Sur la transformation de l'acétal en aldéhyde. Comptes Rendus Hebdomadaires des Séances de L'Academie des Sciences. 48, 1121-1122. Retrieved from <https://gallica.bnf.fr/ark:/12148/bpt6k30054/f1117.item>
- Sur l'action du perchlorure de phosphore sur l'acétal. Bull. Soc. Chim. 45-47. Retrieved from <https://books.google.mw/books?id=4II5AAAACAAJ&pg=PA5>
- Sur l'isomérisation des combinaisons organiques. Comptes Rendus Hebdomadaires des Séances de L'Academie des Sciences. 49, 134-135. Retrieved from <https://gallica.bnf.fr/ark:/12148/bpt6k3006f/f136>
- Ueber die Identität des Aethylidenchlorürs und des Chlorürs des gechlorten Aethyls. Justus Liebigs Ann. Chem. 1860, 113(1), 110-112. <https://doi.org/10.1002/jlac.18601130117>

A LIST OF BEILSTEIN'S PUBLICATIONS

1856

- Ueber die Diffusion von Flüssigkeiten. Justus Liebigs Ann. Chem. 99(2), 165-197. <https://doi.org/10.1002/jlac.18560990203>

1858

- Ueber das Murexid. Justus Liebigs Ann. Chem. 107(2), 176-191. <https://doi.org/10.1002/jlac.18581070206>; Inaugural-Dissertation zur Erlangung der Philosophischen - Doctor - Würde, von Fr. C. Beilstein aus Russland, Göttingen.
- With A. Geuther. Ueber das Natriumamid. Justus Liebigs Ann. Chem. 108(1), 88-102. <https://doi.org/10.1002/jlac.18581080119>

1859

- Ueber die Einwirkung verschiedener Aetherarten auf Aether-Natron und über die Aethylkohlenensäure. Justus Liebigs Ann. Chem. 112(1), 121-125. <https://doi.org/10.1002/jlac.18591120113>; Action des différents éthers sur l'alcoolate de soude et sur l'acide éthylcarbonique. Comptes Rendus Hebdomadaires des Séances de L'Academie des Sciences. 48, 960-963. Retrieved from <https://gallica.bnf.fr/ark:/12148/bpt6k30054/f956>

1860

- Ueber die Identität des Chlorbenzols mit dem gechlorten Chlorbenzyl (Bichlortoluol). Justus Liebigs Ann. Chem. 116(3), 336-356. <https://doi.org/10.1002/jlac.18601160307>
- Notiz über die Einwirkung des Phosphorsuperchlorides auf Cyanursäure. Justus Liebigs Ann. Chem. 116(3), 357-358. <https://doi.org/10.1002/jlac.18601160308>
- With F. Seelheim. Ueber das Saligenin. Justus Liebigs Ann. Chem. 117(1), 83-91. <https://doi.org/10.1002/jlac.18611170104>

1861

- Ueber die Einwirkung des Jodphosphors auf Glycerinsäure. Justus Liebigs Ann. Chem. 120(2), 226-236. <https://doi.org/10.1002/jlac.18611200210>
- Note sur le bromure d'éthyle bromé. Bull. Soc. Chim. 121-122. Retrieved from <https://gallica.bnf.fr/ark:/12148/bpt6k298485n/f124>

1862

- Ueber die Umwandlung der Glycerinsäure in Acrylsäure. Justus Liebigs Ann. Chem. 122(3), 366-374. <https://doi.org/10.1002/jlac.18621220310>
- With A. Geuther. Notiz über das Dicyandiamid. Justus Liebigs Ann. Chem. 123(2), 241-245. <https://doi.org/10.1002/jlac.18621230213>

- With R. Rieth. Ueber ein einfaches Verfahren zur Darstellung des Zinkäthyls. Justus Liebigs Ann. Chem. 123(2), 245-248. <https://doi.org/10.1002/jlac.18621230214>
- With R. Rieth. Ueber neue synthetische Bildungsweisen des Amylens und des Propylens. Justus Liebigs Ann. Chem. 124(1), 242-248. <https://doi.org/10.1002/jlac.18621240109>

1863

- With R. Rieth. Ueber die Zersetzung der Aldehyde und Acetone durch Zinkäthyl. Justus Liebigs Ann. Chem. 126(2), 241-247. <https://doi.org/10.1002/jlac.18631260212>
- With R. Rieth. Ueber die Darstellung des Zinkäthyls. Justus Liebigs Ann. Chem. 126(2), 248-250. <https://doi.org/10.1002/jlac.18631260213>
- With R. Rieth. Notiz über die Darstellung des Jodäthyls. Justus Liebigs Ann. Chem. 126(2), 250-251. <https://doi.org/10.1002/jlac.18631260214>
- With P. Christofle. Note sur la coloration de la flamme de l'hydrogène par le phosphore et ses composés. Comptes Rendus Hebdomadaires des Séances de L'Academie des Sciences. 56, 399-401. Retrieved from <https://gallica.bnf.fr/ark:/12148/bpt6k3013s/f399>
- With W. Kellner. Ueber Trinitroressol und Chrysanissäure. Justus Liebigs Ann. Chem. 128(2), 164-177. <https://doi.org/10.1002/jlac.18631280205>
- With A. Reinecke. Ueber die Reduktion der salicyligen Säure zu Saligenin. Justus Liebigs Ann. Chem. 128(2), 179-180. <https://doi.org/10.1002/jlac.18631280207>
- With A. Wilbrand. Ueber eine neue Reihe isomerer Verbindungen der Benzoëgruppe. — Nitrodracylsäure und deren Derivate. Justus Liebigs Ann. Chem. 128(3), 257-273. <https://doi.org/10.1002/jlac.18631280302>; Vorläufige Notiz über Nitrodracylsäure. Justus Liebigs Ann. Chem. 126(2), 255-256. <https://doi.org/10.1002/jlac.18631260217>

1864

- Über die Reduktion der Nitrokörper durch Zinn und Salzsäure. Justus Liebigs Ann. Chem. 130(2), 242-245. <https://doi.org/10.1002/jlac.18641300215>
- With P. Alexeyeff. Préparation facile du zinc-éthyle. Synthèse du propylène. Comptes Rendus Hebdomadaires des Séances de L'Academie des Sciences. 58, 171-173. Retrieved from <https://gallica.bnf.fr/ark:/12148/bpt6k3015d/f173.item>

- With E. Reichenbach. Untersuchungen über Isomerie in der Benzoëreihe. Zweite Abhandlung. Justus Liebigs Ann. Chem. 132(2), 137-155. <https://doi.org/10.1002/jlac.18641320202>
- With E. Reichenbach. Untersuchungen über Isomerie in der Benzoëreihe: Ueber die Natur der sogenannten Salylsäure. Dritte Abhandlung. Justus Liebigs Ann. Chem. 132(3), 309-321. <https://doi.org/10.1002/jlac.18641320309>

1865

- Ueber das Xylol. Justus Liebigs Ann. Chem. 133(1), 32-47. <https://doi.org/10.1002/jlac.18651330103>
- Ueber Amidozimmtsäure und Carbostyryl. Zeitschrift für Chemie, 1, 1-3. Retrieved from <https://archive.org/details/zeitschriftfrch06unkngoog/page/n6/mode/2up>
- Ueber die isomeren Chlorbenzoësäuren. Zeitschrift für Chemie, 1, 141-144. Retrieved from <https://archive.org/details/zeitschriftfrch06unkngoog/page/n146/mode/2up>
- Ueber einige Derivate der Brenzschleimsäure. Zeitschrift für Chemie, 1, 144-147. Retrieved from <https://archive.org/details/zeitschriftfrch06unkngoog/page/n150/mode/2up>
- Ueber eine neue Bildungsweise der Toluylsäure und Terephtalsäure. Zeitschrift für Chemie, 1, 212-214. Retrieved from <https://archive.org/details/zeitschriftfrch06unkngoog/page/n220/mode/2up>
- Beschreibendes und theoretisches Handbuch der Chemie. Von W. Odling. Deutsch von Dr. A. Oppenheim. Erlangen 1865, F. Enke. I Band. (Book review). Zeitschrift für Chemie, 1, 254-256. Retrieved from <https://archive.org/details/zeitschriftfrch06unkngoog/page/n264/mode/2up>
- Ueber das Cumel des Steinkohlentheers. Zeitschrift für Chemie, 1, 277-280. Retrieved from <https://archive.org/details/zeitschriftfrch06unkngoog/page/n286/mode/2up>
- With P. Geitner. Ueber Amidodracylsäure und Amidobenzoësäure. Zeitschrift für Chemie, 1, 505-506. Retrieved from <https://archive.org/details/zeitschriftfrch06unkngoog/page/n514/mode/2up>
- Einleitung in das Studium der organischen Chemie von A. Butlerow. 385S. Kasan 1864-1865. (Book review). Zeitschrift für Chemie, 1, 727-730. Retrieved from <https://archive.org/details/zeitschriftfrch06unkngoog/page/n736/mode/2up>
- With F. Schlun. Untersuchungen über Isomerie in der Benzoëreihe. Vierte Abhandlung. Ueber die isomeren Chlorbenzoësäuren. Justus Liebigs Ann.

- Chem. 133(2), 239-252. <https://doi.org/10.1002/jlac.18651330218>
- With A. Reinecke. Ueber Cyanverbindungen der aromatischen Aldehyde. Justus Liebigs Ann. Chem. 136(2), 169-176. <https://doi.org/10.1002/jlac.18651360213>; Zeitschrift für Chemie, 1, 464-466. Retrieved from <https://archive.org/details/zeitschriftfrch06unkngoog/page/n474/mode/2up>
- With H. Schmelz. Ueber einige Derivate der Brenzschleimsäure. Justus Liebigs Ann. Chem. Suppl. 3, 275-286. Retrieved from <https://babel.hathitrust.org/cgi/pt?id=uva.x002457967&view=1up&seq=283>
- Ueber Amidozimmtsäure und Carbostyryl. Zeitschrift für Chemie, 1, 1-3. Retrieved from <https://archive.org/details/zeitschriftfrch06unkngoog/page/n6/mode/2up>
- 1866
- With H. Yssel de Schepper. Untersuchungen über die Kohlenwasserstoffe des Steinkohlentheers. Zweite Abhandlung. Ueber die Umwandlung des Xylols in Toluylsäure und Terephtalsäure. Justus Liebigs Ann. Chem. 137(3), 301-311. <https://doi.org/10.1002/jlac.18661370306>
- With A. Kögler. Untersuchungen über die Kohlenwasserstoff des Steinkohlentheers. Dritte Abhandlung. Ueber das Cumol des Steinkohlentheers. Justus Liebigs Ann. Chem. 137(3), 317-327. <https://doi.org/10.1002/jlac.18661370308>
- With P. Geitner. Untersuchungen über Isomerie in der Benzoëreihe. Fünfte Abhandlung. Ueber Amido-benzoësäure und Amidodracylsäure. Justus Liebigs Ann. Chem. 139(1), 1-16. <https://doi.org/10.1002/jlac.18661390102>
- With P. Geitner. Untersuchungen über Isomerie in der Benzoëreihe. Sechste Abhandlung. Ueber das Verhalten der Homologen des Benzols gegen Chlor. Justus Liebigs Ann. Chem. 139(3), 331-342. <https://doi.org/10.1002/jlac.18661390308>
- Ueber die Nichtidentität des Chlortoluols mit dem Chlorbenzyl. Zeitschrift für Chemie, 2, 17-19. Retrieved from https://archive.org/details/bub_gb_MgY4AAAAMAAJ/page/n23/mode/2up
- Ueber isomere Chlortoluole. Zeitschrift für Chemie, 2, 307-308. Retrieved from https://archive.org/details/bub_gb_MgY4AAAAMAAJ/page/n313/mode/2up
- With G. Hirzel. Ueber die Oxydationsproducte des Steinkohlentheer-Cumols (Trimethyl-Benzol). Zeitschrift für Chemie, 2, 503-504. Retrieved from https://archive.org/details/bub_gb_MgY4AAAAMAAJ/page/n511/mode/2up
- 1867
- Rukovodstvo k kachestvennomu khimicheskomu analizu (Manual of Qualitative Chemical Analysis). Tipografiya Tovarishchestva Obshchestvennaya Pol'za, Sankt-Peterburg.
- Anleitung zur qualitativen chemischen Analyse. Verlag Von Quandt & Händel, Leipzig.
- Über das Verhalten des Toluols gegen Brom. Bulletin de l'Académie Impériale Des Sciences De S^T-Petersbourg, Ser. 3. 1867, 11, 301-302. Retrieved from <https://babel.hathitrust.org/cgi/pt?id=osu.32435065017626&view=1up&seq=163>; Justus Liebigs Ann. Chem. 143(3), 369-372. <https://doi.org/10.1002/jlac.18671430320>
- With U. Kreuzler. Über Para-Nitrotoluylsäure und deren Derivate. Bulletin de l'Académie Impériale Des Sciences De S^T-Petersbourg, Ser. 3., 11, 412-428. Retrieved from <https://babel.hathitrust.org/cgi/pt?id=osu.32435065017626&view=1up&seq=218>
- With U. Kreuzler. Untersuchungen über Isomerie in der Benzoëreihe: Siebente Abhandlung. Ueber Para-Nitrotoluylsäure und deren Derivate. Justus Liebigs Ann. Chem. 144(2), 163-184. <https://doi.org/10.1002/jlac.18671440207>
- Ueber Benzylbromid und Bromtoluol. Zeitschrift für Chemie, 3, 281-282. Retrieved from <https://archive.org/details/zeitschriftfrch16unkngoog/page/n288/mode/2up>
- With A. Kuhlberg. Ueber substituirte Alkohole und Aldehyde. Zeitschrift für Chemie, 3, 467-469. Retrieved from <https://archive.org/details/zeitschriftfrch16unkngoog/page/n474/mode/2up>
- With A. Kuhlberg. Ueber Substitutionsproducte des Toluols. Zeitschrift für Chemie, 3, 513-514. Retrieved from <https://archive.org/details/zeitschriftfrch16unkngoog/page/n520/mode/2up>
- Rukovodstvo k kachestvennomu khimicheskomu analizu. Tipografiya Tovarishchestva Obshchestvennaya Pol'za, Sankt-Peterburg.
- 1868
- Inleiding Tot De Qualitative Chemische Analyse (H. IJssel de Scheppe, Trans.). Bij G. Brouwer, Te Deventer.
- Rukovodstvo k kolichestvennomu analizu (Manual of Quantitative Analysis). Tipografiya Tovarishchestva Obshchestvennaya Pol'za, St. Petersburg.

- With A. Kuhlberg. Ueber einige Derivative des Toluols. *Zeitschrift für Chemie*. 4, 25-27. Retrieved from <https://archive.org/details/zeitschriftfrch13unkngoog/page/n32/mode/2up>
- With A. Kuhlberg. Ueber isomere Tetra- und Pentachlortoluole. *Zeitschrift für Chemie*. 4, 276- 278. Retrieved from <https://archive.org/details/zeitschriftfrch13unkngoog/page/n284/mode/2up>
- With A. Kuhlberg. Ueber Hexachlortoluole. *Zeitschrift für Chemie*. 4, 561-563. Retrieved from <https://archive.org/details/zeitschriftfrch13unkngoog/page/n566/mode/2up>
- With A. Kuhlberg. Ueber Para-Dichlor- und Trichlorbenzoesäure. *Zeitschrift für Chemie*. 4, 661-664. Retrieved from <https://archive.org/details/zeitschriftfrch13unkngoog/page/n666/mode/2up>
- Ueber die Oxydationsproducte des Theer-Cumols. *Zeitschrift für Chemie*. 4, 672. Retrieved from <https://archive.org/details/zeitschriftfrch13unkngoog/page/n678/mode/2up>

1869

- With A. Kuhlberg. Ueber substituirte Alkohole und Aldehyde. *Justus Liebigs Ann. Chem.* 147(3), 339-355. <https://doi.org/10.1002/jlac.18681470306>
- With A. Kuhlberg. Untersuchungen über Isomerie in der Benzoëreihe. Neunte Abhandlung. Ueber die gechlorten Derivate des Toluols. *Justus Liebigs Ann. Chem.* 150(3), 286-314. <https://doi.org/10.1002/jlac.18691500303>
- With A. Kuhlberg. Untersuchungen über Isomerie in der Benzoëreihe. Zehnte Abhandlung. Ueber Di- und Trichlorbenzoesäure. *Justus Liebigs Ann. Chem.* 152(2), 224-246. <https://doi.org/10.1002/jlac.18691520212>; *Zh. Russ. Khim. O-va*, 1, 155-172.
- With A. Kuhlberg. Ueber Heptachlortoluole. *Zeitschrift für Chemie*. 5, 75-77. Retrieved from <https://archive.org/details/zeitschriftfrch07unkngoog/page/n82/mode/2up>
- Ueber die Identität von Dichlorbenzoesäure und Para-Dichlorbenzoesäure. *Zeitschrift für Chemie*. 5, 180-181. Retrieved from <https://archive.org/details/zeitschriftfrch07unkngoog/page/n188/mode/2up>
- With A. Kuhlberg. Ueber Perchlorbenzol und seine Bildung aus Toluol und Xylol. *Zeitschrift für Chemie*. 5, 183. Retrieved from <https://archive.org/details/zeitschriftfrch07unkngoog/page/n190/mode/2up>
- With A. Kuhlberg. Ueber eine Reihe isomerer Toluol-Derivative. *Zeitschrift für Chemie*. 5, 280-281.

- Retrieved from <https://archive.org/details/zeitschriftfrch07unkngoog/page/n288/mode/2up>
- Supplementband zu Gmelin Handbuch der Chemie. Seite 1-516, bearbeitet von A. Husemann; Seite 517-1272, bearbeitet von K. Kraut, 2 Abthl. Heidelberg 1867-68. K. Winter. (Book review). *Zeitschrift für Chemie*. 5, 287-288. Retrieved from <https://archive.org/details/zeitschriftfrch07unkngoog/page/n294/mode/2up>
- With A. Kuhlberg. Ueber Aethyl-Phenol. *Zeitschrift für Chemie*. 5, 461-463. Retrieved from <https://archive.org/details/zeitschriftfrch07unkngoog/page/n468/mode/2up>
- With A. Kuhlberg. Ueber isomere Nitrotoluole und Toluidine. *Zeitschrift für Chemie*. 5, 521-524. Retrieved from <https://archive.org/details/zeitschriftfrch07unkngoog/page/n528/mode/2up>
- With A. Kuhlberg. Ueber isomere Nitroäthylbenzole und Xylidine. *Zeitschrift für Chemie*. 5, 524-525. Retrieved from <https://archive.org/details/zeitschriftfrch07unkngoog/page/n532/mode/2up>
- With A. Kuhlberg. Ueber Dichlor- und Trichlorbenzoesäure. *Zeitschrift für Chemie*. 5, 526-529. Retrieved from <https://archive.org/details/zeitschriftfrch07unkngoog/page/n534/mode/2up>
- With A. Kuhlberg. Benzolderivative aus Toluol. *Zeitschrift für Chemie*. 5, 529-529. Retrieved from <https://archive.org/details/zeitschriftfrch07unkngoog/page/n536/mode/2up>
- With A. Kuhlberg. Issledovaniya ob izomerakh v benzoynom ryadu. X. O dvu- i trikhlorbenzoynykh kislotakh (Research on Isomers in the Benzoic Series. X. About di- and trichlorobenzoic acids). *Zh. Russ. Khim. O-va*, 1, 155-172.

1870

- With A. Kuhlberg. Untersuchungen über Isomerie in der Benzoëreihe. Elfte Abhandlung. Die isomeren Formen des Nitrotoluols. *Justus Liebigs Ann. Chem.* 155(1), 1-29. <https://doi.org/10.1002/jlac.18701550102>; *Zh. Russ. Khim. O-va*, 2, 131-151.
- With A. Kuhlberg. Untersuchungen über Isomerie in der Benzoëreihe. Zwölfte Abhandlung. Ueber die isomeren Toluidine. *Justus Liebigs Ann. Chem.* 156(1), 66-84. <https://doi.org/10.1002/jlac.18701560110>; *Zh. Russ. Khim. O-va*, 2, 229-242.
- With A. Kuhlberg. Untersuchungen über Isomerie in der Benzoëreihe. Dreizehnte Abhandlung. Ueber einige Derivate des Aethylbenzols. *Justus Liebigs Ann. Chem.* 156(2), 206-215. <https://doi.org/10.1002/jlac.18701560213>

—With A. Kuhlberg. Ueber isomere Nitrotoluole und Toluidine. *Zeitschrift für Chemie*. 6, 102-103.

Retrieved from <https://archive.org/details/zeitschriftfrch11unkngoog/page/n110/mode/2up>

—J. Wiesner, Die technisch verwendeten Gummiarten, Harze und Balsame. Erlangen, F. Enke. 1869. 205 S. (Book review). *Zeitschrift für Chemie*. 6, 192.

Retrieved from <https://archive.org/details/zeitschriftfrch11unkngoog/page/n200/mode/2up>

—With A. Kuhlberg. Zur Kenntniss des Ortho-Nitrotoluols. *Zeitschrift für Chemie*. 6, 298-299.

Retrieved from <https://archive.org/details/zeitschriftfrch11unkngoog/page/n306/mode/2up>

—With A. Kuhlberg. Ueber Ortho-Nitrotoluols. *Zeitschrift für Chemie*. 6, 417-418.

Retrieved from <https://archive.org/details/zeitschriftfrch11unkngoog/page/n424/mode/2up>

—Ueber die Gewinnung des Jods ans Rückständen. *Zeitschrift für Chemie*. 6, 528-529.

Retrieved from <https://archive.org/details/zeitschriftfrch11unkngoog/page/n536/mode/2up>; Izvlecheniye yoda iz ostatkov (On the Extraction of Iodine from the Residues). *Zh. Russ. Khim. O-va*, 2, 186-205.

—Fortsetzung zu Gmelin's Handb. Der Chemie. Bearbeitet und herausgegeben von K. Kraut. Register zu Gmelin's Handb. Der Chemie. Bd.4-8 und Suppl. Von K. Kraut. Heidelberg, K. Winter. (Book review). *Zeitschrift für Chemie*. 6, 672. Retrieved from

<https://archive.org/details/zeitschriftfrch11unkngoog/page/n680/mode/2up>

—With A. Kuhlberg. O izomernykh nitrotoluolakh (About Isomeric Nitrotoluenes). *Zh. Russ. Khim. O-va*, 2, 131-152.

—With A. Kuhlberg. Ob izomernykh toluidinakh (About Isomeric Toluidines). *Zh. Russ. Khim. O-va*, 2, 229-242.

—With A. Kuhlberg. O nektorykh proizvodnykh etilbenzola (On Some Derivatives of Ethylbenzene). *Zh. Russ. Khim. O-va*, 2, 268-274.

1871

—With A. Kuhlberg. Untersuchungen über Isomerie in der Benzoëreihe. Vierzehnte Abhandlung. Ueber die Bestimmung des chemischen Ortes in einigen Toluolderivaten. *Justus Liebigs Ann. Chem.* 158(3), 335-353. <https://doi.org/10.1002/jlac.18711580310>

—With A. Kuhlberg. Ueber nitrirtes Ortho-Toluidin. *Zeitschrift für Chemie*. 7, 99-100. Retrieved from <https://archive.org/details/zeitschriftfrch31unkngoog/page/n106/mode/2up>

—With A. Kuhlberg. Isomere Toluylen-Diamine. *Zeitschrift für Chemie*. 7, 134-135. Retrieved from

<https://archive.org/details/zeitschriftfrch31unkngoog/page/n142/mode/2up>

—With A. Kuhlberg. Ueber Meta-Nitrozimmtsäure und Meta-Nitrobenzoesäure. *Zeitschrift für Chemie*. 7, 616-618.

Retrieved from <https://archive.org/details/zeitschriftfrch31unkngoog/page/n624/mode/2up>

—With A. Kuhlberg. Ob opredelenii khimicheskogo mesta v nekotorykh proizvodnykh toluola (Determination of the Chemical Site in Some Toluene Derivatives). *Zh. Russ. Khim. O-va*, 3, 128-141.

1872

—With A. Kuhlberg. Untersuchungen über Isomerie in der Benzoëreihe. Vierzehnte Abhandlung. Ueber Zimmtsäure und Metanitrobenzoesäure. *Justus Liebigs Ann. Chem.* 163(1), 121-143. <https://doi.org/10.1002/jlac.18721630107>

—Ueber den Nachweis von Chlor, Brom und Jod in organischen Substanzen. *Ber. dtsh. chem. Ges.* 5(2), 620-621. <https://doi.org/10.1002/cber.18720050209>

—Ob otkrytii khlor, broma i yoda v organicheskikh soyedineniyakh (On the Discovery of Chlorine, Bromine and Iodine in Organic Compounds). *Zh. Russ. Khim. O-va*, 4, 308, 358-359.

—With A. Kuhlberg. O korichnoy i meta-nitrobenzoynoy kislotakh (About Cinnamic and Meta-Nitrobenzoic Acids). *Zh. Russ. Khim. O-va*, 4, 79-95.

1873

—A Manual of Qualitative Chemical Analysis, (W. Ramsay, Trans.), William Collins, Sons, & Company, London, Glasgow.

—Die chemische Grossindustrie auf der Weltausstellung zu Wien im Jahre 1873, Verlag Von Quandt und Händel, Leipzig.

—With A. Kuhlberg. Ueber die Nitroderivate des Naphthalins. *Justus Liebigs Ann. Chem.* 169(1-2), 81-100. <https://doi.org/10.1002/jlac.18731690105>

—With A. Kupffer. Ueber Cymole. *Justus Liebigs Ann. Chem.* 170(3), 282-290. <https://doi.org/10.1002/jlac.18731700303>

—With A. Kupffer. Ueber Cuminsäure. *Justus Liebigs Ann. Chem.* 170(3), 301-304. <https://doi.org/10.1002/jlac.18731700306>

—With A. Kuhlberg. Ueber Trinitro-Naphtaline. *Ber. dtsh. chem. Ges.* 6(1), 647-649. <https://doi.org/10.1002/cber.187300601202>

—With A. Kupffer. Mittheilungen. I. Ueber Cymole.

- Ber. dtsch. chem. Ges. 6(2), 1181-1184. <https://doi.org/10.1002/cber.18730060299>
- Ueber die Metall-Derivate des Cyanamids. Ber. dtsch. chem. Ges. 6(2), 1185-1185. <https://doi.org/10.1002/cber.187300602100>
- Die chemische Grossindustrie auf der Weltaustellung zu Wien im Jahre 1873. Verlag Von Quandt & Händel, Leipzig. Retrieved from <https://opacplus.bsb-muenchen.de/title/BV013564871>
- With A. Kuhlberg. O nitroproizvodnykh naftalina (About Nitro- Derivatives of Naphthalene). Zh. Russ. Fiz.-Khim. O-va, 5, 256-270.
- With A. Kupffer. O tsimole (About Cymol). Zh. Russ. Fiz.-Khim. O-va, 5, 428-434.
- With A. Kupffer. O polynom masle (About Wormwood Oil). Zh. Russ. Fiz.-Khim. O-va, 5, 435-444.
- With A. Kupffer. O kuminovoy kislote (About Cumic Acid). Zh. Russ. Fiz.-Khim. O-va, 5, 444-447.
- 1874
- With A. K. Krupskiy. Fabrichnaya khimicheskaya promyshlennost' zapadno-yevropeyskikh stran na vseмирnoy vystavke v Vene 1873 goda. Sankt-Peterburg.
- With A. Kurbatow. Ueber den Zusammenhang substituierter Benzole und Phenole. Ber. dtsch. Chem. Ges. 7(2), 1395-1399. <https://doi.org/10.1002/cber.187400702141>
- With A. Kurbatow. Ueber gechlortes Phenylsenföl und dessen Derivate. Ber. dtsch. Chem. Ges. 7(2), 1489-1491. <https://doi.org/10.1002/cber.187400702168>
- With A. Kurbatow. Ueber isomere Dichlorbenzole. Ber. dtsch. Chem. Ges. 7(2), 1759-1762. <https://doi.org/10.1002/cber.187400702249>
- 1875
- With A. Kurbatow. O sootnoshenii ryadov zameshchennykh benzolov i fenolov (On the Ratio of the Series of Substituted Benzenes and Phenols). Zh. Russ. Khim. O-va. 7, 10-32.
- With A. Kurbatow. Ueber den Zusammenhang substituierter Benzole und Phenole. Justus Liebigs Ann. Chem. 176(1), 27-54. <https://doi.org/10.1002/jlac.18751760104>
- Untersuchungen über Isomerie in der Benzoëreihe. Fünfzehnte Abhandlung. Ueber Dichlorbenzoësäuren. Justus Liebigs Ann. Chem. 179(3), 283-295. <https://doi.org/10.1002/jlac.18751790303>
- Ueber Dichlorbenzoësäure. Ber. dtsch. chem. Ges. 8(1), 813-815. <https://doi.org/10.1002/cber.187500801268>
- Notiz über Chlorsalicylsäure. Ber. dtsch. chem. Ges. 8(1), 816-816. <https://doi.org/10.1002/cber.187500801269>
- Ueber Dichlorbenzoësäure. Ber. dtsch. chem. Ges. 8(2), 924-925. <https://doi.org/10.1002/cber.18750080208>
- With A. Kurbatow. Ueber m-Chlornitrobenzol. Ber. dtsch. chem. Ges. 8(2), 1417-1418. <https://doi.org/10.1002/cber.187500802150>
- With A. Kurbatow. Ueber Di- und Trichloranilin. Ber. dtsch. chem. Ges. 8(2), 1655-1656. <https://doi.org/10.1002/cber.187500802226>
- 1876
- An Introduction to Qualitative Chemical Analysis (I. J. Osbun, Trans.), Van Nostrand, New York.
- With A. Kurbatow. Ueber Tetrachlorbenzol. Ber. dtsch. chem. Ges. 9(1), 579-580. <https://doi.org/10.1002/cber.187600901179>
- With A. Kurbatow. Ueber Chlornitraniline. Ber. dtsch. chem. Ges. 9(1), 633-635. <https://doi.org/10.1002/cber.187600901194>
- With A. Kurbatow. Ueber die Substitution im Benzol. Justus Liebigs Ann. Chem. 182(1-2), 94-112. <https://doi.org/10.1002/jlac.18761820108>
- 1877
- With A. Kurbatow. O produktakh zameshcheniya benzola (About Benzene Substitution Products). Zh. Russ. Fiz.-Khim. O-va. 9, 99-114.
- With A. Kurbatow. Ueber die Chlorderivate des Benzols. Ber. dtsch. chem. Ges. 10(1), 270-274. <https://doi.org/10.1002/cber.18770100180>
- With A. Kurbatow. Ueber das Verhalten einiger Nitrokörper gegen Schwefelwasserstoff. Ber. dtsch. chem. Ges. 10(2), 1992-1994. <https://doi.org/10.1002/cber.187701002184>
- With A. Kurbatow. Ueber Dichloraniline. Ber. dtsch. chem. Ges. 10(2), 2089-2091. <https://doi.org/10.1002/cber.187701002218>
- 1878
- With A. Kurbatow. 1. Ueber die Chlorderivate des Benzols. Justus Liebigs Ann. Chem. 192(1-2), 228-240. <https://doi.org/10.1002/jlac.18781920125>; O khlorzameshchennykh produktakh benzola (On Chloroderivatives of Benzol). Zh. Russ. Fiz.-Khim. O-va. 10, 326-336.

- Ueber die Scheidung des Zinks vom Nickel. Ber. dtsh. Chem. Ges. 11(2), 1715-1718. <https://doi.org/10.1002/cber.187801102130>
- With A. Kurbatow. Ueber Chloraniline. Ber. dtsh. Chem. Ges. 11(2), 1860-1863. <https://doi.org/10.1002/cber.187801102170>
- With A. Kurbatow. Ueber Chlornitroaniline. Ber. dtsh. Chem. Ges. 11(2), 1978-1980. <https://doi.org/10.1002/cber.187801102200>
- With A. Kurbatow. Ueber das Verhalten einiger Nitrokörper gegen Schwefelwasserstoff. Ber. dtsh. Chem. Ges. 11(2), 2056-2057. <https://doi.org/10.1002/cber.187801102228>
- Ueber Perchlorphenolchlorid $C_6Cl_5(OH).Cl_2$, Ber. dtsh. Chem. Ges. 11(2), 2182-2183. <https://doi.org/10.1002/cber.187801102264>
- Ob otdelenii tsinka ot nikelya (Separation of Zinc from Nickel). Zh. Russ. Fiz.-Khim. O-va, 10, 400-404.

1879

- With A. Kurbatow. Ueber Chlor- und Chlornitraniline. Justus Liebigs Ann. Chem. 196(2), 214-238. <https://doi.org/10.1002/jlac.18791960204>
- With A. Kurbatow. Ueber das Verhalten einiger Nitrokörper zu Schwefelwasserstoff. Justus Liebigs Ann. Chem. 197(1), 75-85. <https://doi.org/10.1002/jlac.18791970107>
- With L. Jawein. Ueber die quantitative Bestimmung des Zinks. Ber. dtsh. chem. Ges. 12(1), 446-448. <https://doi.org/10.1002/cber.187901201124>
- With L. Jawein. Behandlung der Bunsen'schen Elemente. Ber. dtsh. chem. Ges. 12(1), 448-448. <https://doi.org/10.1002/cber.187901201125>
- With L. Jawein. Ueber die quantitative Bestimmung des Cadmiums. Ber. dtsh. chem. Ges. 12(1), 759-762. <https://doi.org/10.1002/cber.187901201212>
- With L. Jawein. Ueber die directe Trennung des Mangans vom Eisen. Ber. dtsh. chem. Ges. 12(2), 1528-1531. <https://doi.org/10.1002/cber.18790120280>
- With A. Kurbatow. O khloranilinakh i khlornitroanilinakh (About Chloranilines and Chloronitroanilines). Zh. Russ. Fiz.-Khim. O-va, 11, 325-344.
- With A. Kurbatow. Ob otnoshenii nekotorykh nitrotel k sernistomu vodorodu (On the Relation of Some Nitro bodies to Hydrogen Sulphide). Zh. Russ. Fiz.-Khim. O-va, 11, 368-377.

1880

- With A. Kurbatow. Ueber die Constitution einiger

- Naphtalinderivate. Justus Liebigs Ann. Chem. 202(2), 213-229. <https://doi.org/10.1002/jlac.18802020205>
- With A. Kurbatow. Ueber Dinitronaphtalin. Ber. dtsh. chem. Ges. 13(1), 353-354. <https://doi.org/10.1002/cber.188001301104>
- With A. Kurbatow. Ueber Dinitrobenzoësäure. Ber. dtsh. chem. Ges. 13(1), 355-355. <https://doi.org/10.1002/cber.188001301105>
- With L. Jawein. Ueber die Werthbestimmung von Zink und Zinkstaub. Ber. dtsh. chem. Ges. 13(1), 947-950. <https://doi.org/10.1002/cber.188001301265>
- Ueber Dinitroparatoluidin. Ber. dtsh. chem. Ges. 13(1), 242-244. <https://doi.org/10.1002/cber.18800130166>
- With A. Kurbatow. Ueber die Natur des kaukasischen Petroleums. Ber. dtsh. chem. Ges. 13(2), 1818-1821. <https://doi.org/10.1002/cber.188001302143>
- With A. Kurbatow. Ueber die Kohlenwasserstoffe des amerikanischen Petroleums. Ber. dtsh. chem. Ges. 13(2), 2028-2029. <https://doi.org/10.1002/cber.188001302182>

1881

- With A. Kurbatow. II. Ueber kaukasisches Petroleum. Ber. dtsh. chem. Ges. 14(2), 1620-1622. <https://doi.org/10.1002/cber.18810140211>
- With L. Jawein. Zh. Ob opredelenii i otdelenii nekotorykh metallov (On the Determination and Separation of Certain Metals). Russ. Fiz.-Khim. O-va, 13, 9-18.
- With A. Kurbatow. O stroyenii nekotorykh proizvodnykh naftalina (On the Structure of Some Derivatives of Naphthalene). Zh. Russ. Fiz.-Khim. O-va, 13, 136-149.

1882

- Manuel D'Analyse Chimique Qualitative (A. Buisine, P. Buisine, Trans.), Elie Masson, Lille.
- Ueber Petersburger Rhabarber. Ber. dtsh. chem. Ges. 15(1), 901-902. <https://doi.org/10.1002/cber.188201501194>
- With E. Wiegand. Ueber einige Reaktionen des Aethylenbromids. Ber. dtsh. chem. Ges. 15(1), 1368-1370. <https://doi.org/10.1002/cber.18201501292>
- With E. Wiegand. Ueber Propylenbromid. Ber. dtsh. chem. Ges. 1882, 15(2), 1496-1498. <https://doi.org/10.1002/cber.18820150209>
- With E. Wiegand. Ueber die Darstellung von Propylen. Ber. dtsh. chem. Ges. 15(2), 1498-1499. <https://doi.org/10.1002/cber.18820150210>

- With E. Wiegand. Ueber Isodibrombernsteinsäure. Ber. dtsch. chem. Ges. 15(2), 1499-1500. <https://doi.org/10.1002/cber.18820150211>
- With E. Wiegand. Ueber Angelikaöl. Ber. dtsch. chem. Ges. 15(2), 1741-1742. <https://doi.org/10.1002/cber.18820150265>
- With E. Wiegand. Ueber einige ätherische Oele. Ber. dtsch. chem. Ges. 15(2), 2854-2855. <https://doi.org/10.1002/cber.188201502272>

1883

- Handbuch der organischen Chemie. Zwei Bände (2 vols.). Verlag von Leopold Voss, Hamburg und Leipzig, 1881-1883.
- Lessons in Qualitative Chemical Analysis. (C.O. Curtman, Trans.), St. Louis Stationery & Book Co., Saint Louis (Mo.).
- With E. Wiegand. Ueber kaukasischen Ozokerit. Ber. dtsch. chem. Ges. 16(2), 1547-1551. <https://doi.org/10.1002/cber.18830160209>
- With E. Wiegand. Ueber Alkylsulfaminsäuren. Ber. dtsch. chem. Ges. 16(1), 1264-1268. <https://doi.org/10.1002/cber.188301601281>
- Ueber Petroleumprüfung. Z. f. Analyt. Chem. 22, 309-316. Retrieved from <https://books.google.pl/books?id=6ePmAAAAMAAJ&printsec=frontcover&hl=pl&source>
- With A. Kurbatow. Issledovaniye kavkazskoy nefiti (Study of the Caucasian Oil). Zh. Russ. Fiz.-Khim. O-va, 15, 5-32.

1884

- With E. Wiegand. Ueber eine neue Bildungsweise der Brenztraubensäure. Ber. dtsch. chem. Ges. 17(1), 840-842. <https://doi.org/10.1002/cber.188401701225>
- With E. Wiegand. Ueber Angelikasäure und Tiglinsäure. Ber. dtsch. chem. Ges. 17(2), 2261-2263. <https://doi.org/10.1002/cber.188401702136>
- Obituary. Hans (Julius Anton Edward) Hübner. Ber. dtsch. chem. Ges. 17(2), A763-A776. <https://doi.org/10.1002/cber.188401702326>
- With L. Jawein. Ob opredelenii dostoinstva tsinka i tsinkovoy pyli (About Defining Dignity Zinc and Zinc Dust). Zh. Russ. Fiz.-Khim. O-va, 16, 363-366.

1885

- With E. Wiegand. Ueber einige ungesättigte Verbindungen der Fettreihe, Ber. dtsch. chem. Ges. 18(1), 481-483. <https://doi.org/10.1002/cber.188501801103>

1890

- Handbuch der organischen Chemie. Zweite Auflage. Drei Bände (3 vols. I Bd., 1886; II Bd., 1888; III Bd., 1890). Verlag von Leopold Voss, Leipzig, 1886-1890.
- With L. Jawein, Rukovodstvo k kachestvennomu i kolichestvennomu khimicheskomu analizu (Manual of Quantitative and Qualitative Chemical Analysis). St. Petersburg.
- With O. von Blaese. Untersuchungen über die Basicität der Antimonsäure. Bulletin de l'Académie Impériale Des Sciences De S^T-Pétersbourg, 33, 97-116. Retrieved from <https://www.biodiversitylibrary.org/item/105810#page/105/mode/1up>
- With O. von Blaese. Über die quantitative Bestimmung des Antimons. Bulletin de l'Académie Impériale Des Sciences De S^T-Pétersbourg, 33, 201-207. Retrieved from <https://www.biodiversitylibrary.org/item/105810#page/213/mode/1up>
- With O. von Blaese. Über die Bestimmung des Natrons neben Kali. Bulletin de l'Académie Impériale Des Sciences De S^T-Pétersbourg, 33, 209-211. Retrieved from <https://www.biodiversitylibrary.org/item/105810#page/221/mode/1up>
- With Th. Grosset. Über die Analyse der schwefelsauren Thonerde. Bulletin de l'Académie Impériale Des Sciences De S^T-Pétersbourg, 33, 147-153. Retrieved from <https://www.biodiversitylibrary.org/item/105810#page/155/mode/1up>

1892

- With R. Luther. Über die Verfahren zur Trennung des Eisenoxyds von der Thonerde. Bulletin de l'Académie Impériale Des Sciences De S^T-Pétersbourg, 34, 155-164. Retrieved from <https://www.biodiversitylibrary.org/item/106464#page/160/mode/1up>

1894

- O rabotakh chlenov Russkogo Fiziko-Khimicheskogo Obschestva po aromatcheskomu ryadu. Rech' (On the Works of Members of the Russian Physicochemical Society on the Aromatic Series. Speech). Zh. Russ. Fiz.-Khim. O-va, 26, 39-56.

1896

- With R. Rinne. Über die Bestimmung des Glycerins und die Analyse des Wachses. *Bulletin de l'Académie Impériale Des Sciences De S^T-Pétersbourg*, Sér. 5., 5(4),

283-293. Retrieved from <https://www.biodiversitylibrary.org/item/93790#page/377/mode/1up>

—Pamyati Avgusta Kekule (In memory of August Kekulé). Zh. Russ. Fiz.-Khim. O-va, 28, 703-705.

1899

—Handbuch der organischen Chemie. Dritte Auflage. Vier Bände (4 vols., I Bd., 1893; II Bd. 1896; III Bd. 1897; IV Bd. 1899. Verlag von Leopold Voss, Hamburg, Leipzig, 1893-1899.