



Riko Majima

PROFESSOR RIKŌ MAJIMA.

On November 13th, 1934, Prof. Majima completed his sixtieth year and a feast in honour of him was given in Tokyo by his pupils, and in congratulation of this memorable day in his long life, a sum of contributions gathered among his pupils was presented to him, together with a souvenir of the occasion. On receiving it, he was good enough to give some part of it to the Chemical Society of Japan for the fund of a prize. Accordingly the Majima Prize was established, and from the year 1936 at every Annual Meeting of the Society, it shall be awarded to any person who has done an excellent work in organic chemistry or biochemistry. The papers collected in the present number of this Bulletin, all of which are the recent works of his pupils, are dedicated to Prof. Majima, and the expenses for publishing them are drawn from the same source.

Prof. Rikō Majima was born in Kyoto on the thirteenth day of November in 1874, as the eldest son of Toshitami Majima, a noted physician. His primary and middle school days were spent under his parents in this old city. Without finishing the middle school course, he came to Tokyo in order to prepare himself for the entrance examination of the First Higher School, which he passed successfully in 1890. Although in the middle school days he was rather a weak boy, he could now enjoy perfect health, for the restoration of which he tried every sports in his power: he was indeed once a member of the First Higher School Crew. It is evident that the health and the discipline given him by the sports enabled him to achieve the valuable works in later days. When he entered the Higher School he intended at first to make geology his life-work; but, advised by one of his seniors that his short-sightedness would be inconvenient for his study, he changed his course; and when he was admitted to the Tokyo Imperial University in 1896, he became a student in the Chemical Department of the Faculty of Science.

In the three years of the university life he studied inorganic chemistry under the late Prof. Edward Divers, physical chemistry and analytical chemistry under Prof. Kikunae Ikeda, and organic chemistry and part of physical chemistry under Prof. Joji Sakurai. He received also valuable instructions for the laboratory works from the late Prof. Tamemasa Haga, who had returned from Germany in 1898.

Immediately after his graduation in 1899, he was appointed Assistant and began to work under Prof. Sakurai. In 1903 he was promoted to the position of Assistant Professor. Thus Prof. Majima's research life was commenced, which, for convenience' sake, will be divided into three periods: the Tokyo period, the Sendai period, and the Osaka period.

One of his principal research objects in his Tokyo period was *urushiol*, the main constituent of Japan-lacquer.

In January 1907 he was ordered abroad for the study of inorganic chemistry, against his own interest in the organic branch. He was obedient to the order and his scheme was first to visit Prof. A. Werner, the brilliant initiator of the Co-ordination Theory. When he arrived in Europe, however, a telegram from the Japanese Government commanded him to take organic chemistry as his subject. This unexpected but agreeable change drove him immediately for Kiel from Zürich. It was quite natural that he should have done so, because at the Kiel University there was Prof. Harries, inventor of ozonolysis, probably the best method for the exploration of the constitution of *urushiol*.

At Kiel he was working hard upon *terpene* and partly upon *urushiol*. But unfortunately in the following year he suffered from influenza which brought pneumonia. Soon after recovery he was again infected with erysipelas which was followed by nephritis. Thus he was forced twice to lie in bed in the Kiel University Hospital. Then he had to stay at the noted spa Wildungen to ensure complete recovery. It was only after one complete summer semester had passed that he could return to the laboratory. His research work there was kept on again from the beginning of the winter semester of the year 1908 until the end of the summer in 1909.

From the winter semester of the year 1909 until the end of the summer in 1910, he stayed at Zürich under Prof. R. Willstätter, with whom he worked on some oxidation mechanism of aniline.

Then he went over to England to inspect the state of things in the study of chemistry and spent some time at the Davy-Faraday Research Laboratory of the Royal Institution in London. Then passing through the United States of America, he returned to Japan on March 3rd in the year 1911.

Just at that time the Faculty of Science of the Tōhoku Imperial University was newly founded at Sendai. ("Tōhoku" means north-east. This university is so called as Sendai is situated in the north-eastern part of Japan proper). The Faculty was ready to receive him in 1911 as one of the professors. Prof. Majima's Sendai period was thus begun and it was in this period that the works upon *urushiol* were published. For this research, in 1913 he was honoured with the Sakurai Prize from the Tokyo Chemical Society and then in 1917 with the Imperial Academy Prize from the Imperial Academy of Japan.

His research field, however, was not confined only to *urushiol*; he also found a new synthetical method for obtaining *indole* by a pyrogenetic reaction of *aniline* and *acetylene*. His endeavour was then naturally directed to the synthetical works upon various *indole* derivatives.

His interest was also directed to many natural colouring matters, e.g. *shikonin*, *carthamin*, and many other sorts of *anthocyanins* (studied partly with Miss C. Kuroda), *mangostin* and *fukugetin* (studied by M. Murakami); and also to synthetical pigments, e.g. some new classes of vat dyes (by M. Nakanishi) and various sorts of photographic sensitizers (by T. Ogata and S. Sakurai). They should specially be cited, as those studies were all executed in Prof. Majima's laboratory under his zealous encouragement.

In his endeavour to elucidate the constitution of *aconitine*, Prof. Majima showed a fair example of his character, or the spirit fighting against a difficult problem to explore the mystery wrapped in it.

Aconitine, the alkaloid of aconitum roots, has many hydroxyl-groups and, indeed, an unparalleled complex nature. Prof. Majima began the study in collaboration with T. Suginome, S. Morio, and H. Shimanuki, and is still continuing it step by step assisted by K. Tamura. Assuredly the difficulties of isolating the *aconitine* in pure state greatly puzzled him in his earlier experiments, but his strenuous efforts brought him a clear decisive result. He could isolate the four sorts of *aconitines*, i.e. *aconitine*, *mesaconitine*, *hypoaconitine*, and *jesaconitine*, in pure forms, from about sixteen different species of aconitum plants.

In 1926 he was elected Member of the Imperial Academy of Japan, and although he was rather a man in the laboratory, he was compelled gradually to take up many administrative responsibilities with relation to the universities in Japan. He became, in 1926, the Director of the Faculty of Science of the Tōhoku Imperial University, which post he held until 1928. He was appointed, in 1927, head of the Organizing Committee of the Science Faculty of the Hokkaido Imperial University which was to be established at Sapporo, and he was, in 1930, appointed Director of that newly opened Faculty, in which post, however, he remained only for a year, as an additional one to the professorship at Sendai. Meanwhile he was also a member of the Organizing Committee of the Department of the Dyestuff-Chemistry of the Tokyo University of Engineering.

In 1931 he was again a member of the Organizing Committee, this time, of the Faculty of Science of the Osaka Imperial University, and was appointed Professor and Director of this new faculty since its foundation in 1932. In 1933, he and his family left Sendai, where they had lived twenty-two long years, and removed to Osaka. Thus his Osaka period was begun.

It is the present writer's happy duty to report that he is still assiduously engaged in his research works on *aconitines*, etc., in his new laboratory, with the same health and energy as were enjoyed in his Sendai period. He

may perhaps thus be making good for the time long lost in the administrative affairs in the various universities.

Outside the universities he has been also active since 1917 as a member of the research staff of the Institute of Physical and Chemical Research, Tokyo; since 1920 as a member of the National Research Council of Japan ("Gakujutu Kenkyu Kaigi"); and since 1933 as a member of a committee of the Foundation for the Promotion of Scientific and Industrial Research of Japan ("Nippon Gakujutu Sinko Kai"). In 1924 Prof. Majima was sent to the Fifth Conference of the International Union of Pure and Applied Chemistry held at Copenhagen as the delegate of the National Research Council of Japan. In 1927 he was elected Honorary Member of the Chemical Society of Holland.

Prof. Majima's life is not complete if his literary work is left unmentioned. It is the compilation of the complete abstracts of Japanese chemical literatures. For this painstaking work he received donations from the "Keimei Kai" Foundation and was also given contributions from many supporters. Consequently he was able to found a society called "Nippon Kagaku Kenkyu Kai" in 1926, with the sole purpose of continuing the work already commenced as early as 1918 and of publishing the materials thus accumulated. In the year 1927 the first product of his endeavours appeared in the form of a book entitled "Nippon Kagaku Sōran" Vol. I, which covers the period of 1877-1900. Since then Vol. II (1901-1908), Vol. III (1909-1913), Vol. IV (1914-1917) and Vol. V (1918-1921) have all been published. Besides these a monthly magazine with the same title has also been edited by him. It publishes the complete abstracts of the current Japanese chemical literatures, beginning with the year 1927. The gap between the year 1922 and 1926 will be filled with two more volumes of the "Nippon Kagaku Sōran" which are now ready in press. Needless to say, these publications were received with enthusiasm by the Japanese chemists as well as by the whole circles of the scientists in the country.

The green old age of Prof. Majima, who has played such an important rôle in promoting the scientific education and research in Japan and especially served in elevating his special domain of organic chemistry in this country up to the present state, should heartily be congratulated not only by his pupils but by all the Japanese chemists, wishing on their part for his further aid for the future advancement of chemistry in Japan.

Sin'iti KAWAI.

February, 1936.

Bibliography.

The following are Professor Majima's own works arranged mainly chronologically.

- Tamemasa HAGA u. Rikō MAJIMA: Über einige Anhydrobase aus Diaminen der Fettreihe, *Ber.*, **36** (1903), 333-339.
- R. MAJIMA: Über das Gummiarabikum, *J. Tokyo Chem. Soc.*, **26** (1905), 126-134.
- R. MAJIMA u. Shunichi CHO: Über den Hauptbestandteil des japanischen Lacks, *J. Coll. Sci. Imp. Univ. Tokyo*, **25** (1908), Article 6, 1-17.
- R. MAJIMA u. S. CHO: Über einen Hauptbestandteil des japanischen Lacks (Vorläufige Mitteilung.), *Ber.*, **40** (1907), 4390-4393.
- R. MAJIMA: Über die Kondensation der Alkylguanidin mit Acetessigester usw., *ibid.*, **41** (1908), 176-186.
- Carl HARRIES u. R. MAJIMA: Zur Konstitution des Terpinens, *ibid.*, **41** (1908), 2516-2529.
- R. MAJIMA: Zur Konstitution der Eläostearinsäure, *ibid.*, **42** (1909), 674-680.
- R. MAJIMA: Über den Hauptbestandteil des Japanlacks. I. Mitteilung. Über Urushiol und Urushioldimethyläther, *ibid.*, **42** (1909), 1418-1423.
- R. MAJIMA: Über den Hauptbestandteil des Japanlacks. II. Mitteilung. Über die Oxydation des Urushiol-dimethyläthers mit Ozon (I), *ibid.*, **42** (1909), 3664-3673.
- Richard WILLSTÄTTER u. R. MAJIMA: Über die quantitative Bestimmung der Chinone, *ibid.*, **43** (1910), 1171-1175.
- R. WILLSTÄTTER u. R. MAJIMA: Zur Kenntnis der Oxydation von Anilin, *ibid.*, **43** (1910), 2588-2593.
- R. MAJIMA: Zur Kenntnis der Oxydation von Anilin. II., *ibid.*, **44** (1911), 223-234.
- R. MAJIMA u. Yoshihiko AOKI: Zur Kenntnis der Oxydation von Anilin. III., *ibid.*, **44** (1911), 3080-3084.
- R. MAJIMA: Über die japanische Lackindustrie, *Chem. Ztg.*, (1911), 164.
- R. MAJIMA: Über den Hauptbestandteil des Japanlacks. III. Mitteilung. Die katalytische Reduktion von Urushiol, *ibid.*, **45** (1912), 2727-2730.
- R. MAJIMA u. Teppei OKADA: Über die katalytische Reduktion von Eläostearinsäure, *Sci. Rep. Tohoku Imp. Univ.*, **1** (1912), 169-170.
- R. MAJIMA u. T. OKADA: Über die stark ungesättigten höheren Fettsäuren in Sardinenträn, *ibid.*, **2** (1914), 1-18.
- R. MAJIMA u. Ikuya NAKAMURA: Über den Hauptbestandteil des Japanlacks. IV. Mitteilung. Einige Derivate des Hydrourushiole, *Ber.*, **46** (1913), 4080-4088.
- R. MAJIMA u. I. NAKAMURA: Eine neue Synthese von höheren Phenolen, *ibid.*, **46** (1913), 4089-4095.
- R. MAJIMA: Über den Hauptbestandteil des Japanlacks. V. Mitteilung. Über die Konstitution von Hydrourushiol, *ibid.*, **48** (1915), 1593-1597.
- R. MAJIMA u. I. NAKAMURA: Über das Iso-hydrourushiol und sein niederes Homologes, *ibid.*, **48** (1915), 1597-1603.
- Junzo KUROSAWA: Über 1-n-Propyl-2,3-dioxy-benzol, *ibid.*, **48** (1915), 1603-1606.
- R. MAJIMA u. Joshihide TAHARA: Über den Hauptbestandteil des Japanlacks. VI. Mitteilung. Über die Synthese des Hydrourushiole, *ibid.*, **48** (1915), 1606-1611.
- R. MAJIMA u. Yoshitaro OKAZAKI: Zur Kenntnis des 2,3-Dioxy-toluole (Isohomobrenzcatechine) und über die Nitroderivate seiner Methyläther, *ibid.*, **49** (1916), 1482-1496.

- R. MAJIMA u. Gitaro TAKAYAMA: Über den Hauptbestandteil des Japanlacks. VII. Mitteilung. Der Urushiol-monomethyläther und der Mechanismus der Oxydation des Urushiois, *ibid.*, **53** (1920), 1907–1916.
- R. MAJIMA: Über den Hauptbestandteil des Japanlacks. VIII. Mitteilung. Stellung der Doppelbindungen in der Seitenkette des Urushiois und Beweisführung, dass das Urushiol eine Mischung ist, *ibid.*, **55** (1922), 172–191.
- R. MAJIMA: Über den Hauptbestandteil des Japanlacks. IX. Mitteilung. Chemische Untersuchung der verschiedenen natürlichen Lackarten, die dem Japanlack nahe verwandt sind, *ibid.*, **55** (1922), 191–214.
- R. MAJIMA, Kwanto NAGAOKA, u. Keisuke YAMADA: Über den Schmelzpunkt einiger fettaromatischer Ketone, *ibid.*, **55** (1922), 215–217.
- R. MAJIMA u. Bannosuke KUBOTA: On the Chemical Constitution of Squalene, *Japanese J. Chem.*, **1** (1922), 19–33.
- R. MAJIMA u. Chika KURODA: On the Colouring Matter of *Lithospermum Erythrorhizon*, *Acta Phytchim.*, **1** (1922), 43–65.
- R. MAJIMA, Tadashi UNNO u. Kashichi ONO: Über die Reaktion zwischen Acetylen und Anilin bei höherer Temperatur, *Ber.*, **55** (1922), 3854–3859.
- R. MAJIMA: Synthetische Versuche in der Indol-Gruppe. I. Mitteilung. Munio KOTAKE: Eine neue Synthese des *racem.* Tryptophans, *ibid.*, **55** (1922), 3859–3865.
- R. MAJIMA: Synthetische Versuche in der Indol-Gruppe. II. Mitteilung. Munio KOTAKE: Über den Einfluss von Lösungsmitteln auf die Grignardsche Reaktion, *ibid.*, **55** (1922), 3865–3872.
- R. MAJIMA u. Tetsuji SHIGEMATSU: Synthetische Versuche in der Indol-Gruppe. III. Mitteilung. Über die Bildung von *N*-Acyl-indolen, *ibid.*, **57** (1924), 1449–1453.
- R. MAJIMA, T. SHIGEMATSU, u. Tatsuo ROKKAKU: Synthetische Versuche in der Indol-Gruppe. IV. Mitteilung. Über einige Indolyl-ketonsäuren, *ibid.*, **57** (1924), 1453–1456.
- R. MAJIMA, Harusada SUGINOME, u. Shin-ichi MORIO: Über die verschiedenen Isomeren des Japaconitins (I. Mitteilung über Aconitum-Alkaloide.), *ibid.*, **57** (1924), 1456–1466.
- R. MAJIMA u. H. SUGINOME: Zur Kenntnis des Aconitins und Pyraconitins (II. Mitteilung über Aconitum-Alkaloide.), *ibid.*, **57** (1924), 1466–1471.
- R. MAJIMA u. S. MORIO: Über das sog. Jesaconitin (III. Mitteilung über Aconitum-Alkaloide.), *ibid.*, **57** (1924), 1472–1476.
- R. MAJIMA u. Munio KOTAKE: Synthetische Versuche in der Indol-Gruppe. V. Mitteilung. Synthese des β -Indolyl-äthanolamins, *ibid.*, **58** (1925), 2037–2041.
- R. MAJIMA u. Toshio HOSHINO: Synthetische Versuche in der Indol-Gruppe. VI. Mitteilung. Eine neue Synthese von β -Indolyl-alkyl-aminen, *ibid.*, **58** (1925), 2042–2046.
- R. MAJIMA u. M. KOTAKE: Synthetische Versuche in der Indol-Gruppe. VII. Mitteilung. Über Nitrieren und Bromieren des β -Indol-carbonsäureesters und eine neue Synthese des Farbstoffs des antiken Purpurs, *ibid.*, **63** (1930), 2237–2245.
- R. MAJIMA u. H. SUGINOME: Über Oxonitin und einige neue Derivate desselben (IV. Mitteilung über Aconitum-Alkaloide.), *ibid.*, **58** (1925), 2047–2051.
- R. MAJIMA u. Heibei SHIMANUKI: Einwirkung von Thionylchlorid auf mehrwertige Alkohole, *Proc. Imp. Acad. Japan*, **2** (1926), 541–546.

- R. MAJIMA u. T. HOSHINO: Über den Mechanismus der Grignardschen Reaktion in der Indol-Reihe, *ibid.*, **3** (1927), 339-341.
- R. MAJIMA u. S. MORIO: Über Hypaconitin, ein neues Aconitum-Alkaloid (V. Mitteilung über Aconitum-Alkaloide.), *Ann.*, **476** (1929), 171-181.
- S. MORIO: Über Mesaconitin, ein zweites neues Aconitum-Alkaloid (VI. Mitteilung über Aconitum Alkaloide.), *ibid.*, **476** (1929), 181-193.
- R. MAJIMA u. S. MORIO: Über die Identität von Aconitin-A, Japaconitin-A und Japaconitin-A₂ (VII. Mitteilung über Aconitum-Alkaloide.), *ibid.*, **476** (1929), 194-203.
- R. MAJIMA u. S. MORIO: Zusammenfassende Bemerkungen über die Natur der Aconitum-Alkaloide (VIII. Mitteilung über Aconitum-Alkaloide.), *ibid.*, **476** (1929), 2 3-214.
- R. MAJIMA, H. SUGINOME, u. H. SHIMANUKI: Über die Molekularformel des Oxonitins und über Oxonin (IX. Mitteilung über Aconitum-Alkaloide.), *Ber.*, **65** (1932), 595-598.
- R. MAJIMA u. S. MORIO: Ein neues Aconitum-Alkaloid (X. Mitteilung über Aconitum-Alkaloide.), *ibid.*, **65** (1932), 599-602.
- R. MAJIMA u. Kunisaburo TAMURA: Über die Synthese einiger Phenole mit ungesättigter Seitenkette, *Proc. Imp. Acad. Japan.*, **9** (1933), 606-608.
- R. MAJIMA u. Shunsuke MURAHASHI: Über die Dehydrierung von Yohimbin, *ibid.*, **10** (1934), 341-344.

The following works were all done by Prof. Majima's pupils under his direct guidance on the themes given by him. The list is alphabetically arranged according to the authors' names.

- Shiro AKABORI: Synthesis of Methoxy-hydroxy-N-methyl-3,4-dihydro-isoquinolinium Salts, *Bull. Chem. Soc. Japan*, **1** (1926), 96, 125.
- S. AKABORI u. Kojiro SAITO: Synthese von Harman und Harmin (VIII. Mitt. d. von Majima u. Kotake angefangene synthetische Versuche in d. Indol-Gruppe), *Ber.*, **63** (1930), 2245.
- Shin-ichiro FUJISE: Synthesis of Some Aromatic Mustard Oil, *J. Chem. Soc. Japan*, **48** (1927), 30.
- S. FUJISE: Über die Stereoisomerie des 8-Oxydekahydrochinolins und seiner Derivate, *Sci. Pap. Inst. Phys. Chem. Research, Japan*, **8** (1928), 161.
- S. FUJISE: Über den Hofmannschen Abbau des Dekahydrochinolins, *ibid.*, **8** (1928), 185.
- S. FUJISE: Über den Hofmannschen Abbau des Octahydro- α -methyl-indols, *ibid.*, **9** (1928), 91.
- S. FUJISE: Synthese des *trans*-O-Dimethylamido-*n*-propyl-cyclohexans und die Wasserspaltung des *O-n*-Propyl-cyclohexanols, *ibid.*, **10** (1929), 88.
- Eiichi FUNAKUBO: Studies on Indol-derivative of Arsenic. Part I. Preparation and Properties of Some Indol- β -arsonic Acids and the Evidence for the β -Arsonic Acid Structure, *J. Chem. Soc. Japan*, **48** (1927), 526.
- E. FUNAKUBO: Studies on Indol-derivatives of Arsenic. Part II. Bye-product obtained by the Preparation of Indol- β -arsonic Acid, *ibid.*, **48** (1927), 581.
- E. FUNAKUBO: Studies on Indol-derivatives of Arsenic. Part III. Preparation of Some *N*-Alkyl-indol- β -arsonic Acids and General Procedure of the Preparation of *N*-alkyl indol, *ibid.*, **48** (1927), 652.

- E. FUNAKUBO: Studies on Indol-derivatives of Arsenic. Part IV. Some Phenylhydrazine-salts and Addition Compounds of α -Methyl-indol- β -arsonic Acid, *ibid.*, **48** (1927), 662.
- E. FUNAKUBO: Studies on Indol-derivatives of Arsenic. Part V. Reaction between Indolylmagnesiumiodide and Inorganic Arsenic Compounds, *ibid.*, **49** (1928), 40.
- E. FUNAKUBO: Studies on Indol-derivatives of Arsenic. Part VI. The Molecular Compounds of Arsenic Halogenide and Indol, *ibid.*, **49** (1928), 48.
- E. FUNAKUBO: Studies on Indol-derivatives of Arsenic. Part VII. Nitration of Indol- β -arsonic Acid and the Preparation of 3-Carboethoxyindol-6-arsonic Acid, *ibid.*, **49** (1928), 104.
- Toshio HOSHINO: Eine neue Darstellungsmethode von Indoleninen und Synthese des sogenannten Eserinkerns, *Proc. Imp. Acad. Japan*, **8** (1932), 171.
- T. HOSHINO: Synthetische Versuche in der Indol-Gruppe. IX. Über eine neue Synthese von Indoleninen, *Ann.*, **500** (1932), 35.
- T. HOSHINO: Synthetische Versuche in der Indol-Gruppe. X. Über die Synthese des Eserin-Ringsystems, *ibid.*, **500** (1932), 42.
- Mosuke HAYASHI: On a New Isomeride of Halogenhydroxy-benzoyl-toluic Acids. Part I. *m*-Chloro-*o*-hydroxy-benzoyl-toluic Acid, *J. Chem. Soc. Japan*, **47** (1926), 672-685.
- M. HAYASHI: On a New Isomeride of Halogenhydroxy-benzoyl-toluic Acids. Part II. *m*-Bromo-*o*-hydroxy-benzoyl-toluic Acid, *ibid.*, **48** (1927), 201-206.
- M. HAYASHI: New Isomerism of Halogeno-hydroxy-benzoyl toluic Acids. Part III. 5 (4 ?)-Methyl-2-(5'-chloro-2'-hydroxy-benzoyl)-benzoic Acid, *ibid.*, **49** (1928), 607-618.
- M. HAYASHI: New Isomerism of Halogeno-hydroxy-benzoyl-toluic Acids. Part IV. 3 (6 ?)-Methyl-2-(3'-chloro-4'-hydroxy-benzoyl)-benzoic Acid, *ibid.*, **49** (1928), 619-625.
- M. HAYASHI: New Isomerism of Halogeno-hydroxy-benzoyl-toluic Acids. Part V. 3 (6 ?)-Methyl-2-(4'-chloro-2'-hydroxy-benzoyl)-benzoic Acid. 3 (6 ?)-Methyl-2-(2'-chloro-4'-hydroxy-benzoyl)-benzoic Acid, *ibid.*, **50** (1929), 1-5.
- M. HAYASHI: New Isomerism of Halogeno-hydroxy-benzoyl-toluic Acids. Part VI. 3 (6 ?)-Methyl-2-(2',5'-dihydroxy-benzoyl)-benzoic Acid, *ibid.*, **50** (1929), 6-7.
- M. HAYASHI: New Isomerism of Halogeno-hydroxy-benzoyl-toluic Acids. Part VII. Attempt to determine the Constitutions of 3 (6 ?)-and 6 (3 ?)-Methyl-2-(5'-chloro-2'-hydroxy-benzoyl)-benzoic Acid, *ibid.*, **50** (1929), 7-10.
- Tessaku IKEDA and Yasuji FUJITA: On the Action of Ozone on Acetic Ester of Iso-borneol, *J. Chem. Soc. Japan*, **48** (1927), 585.
- T. IKEDA: On the Dehydration of Borneol, *ibid.*, **48** (1927), 591.
- T. IKEDA and Y. FUJITA: Contribution to Borneol and Iso-borneol, *ibid.*, **48** (1927), 644.
- T. IKEDA and Y. FUJITA: Essential Oil of *Cunninghamia* Konishi Hayata, *ibid.*, **50** (1929), 66.
- Masakadu INOUE: Preparation of Petroleum from Fatty Oils. Part I, *J. Chem. Soc. Japan*, **42** (1921), 1065.
- M. INOUE: Preparation of Petroleum from Fatty Oils. Part II, *ibid.*, **44** (1923), 78.
- M. INOUE: Preparation of Petroleum from Fatty Oils. Part III. Catalytic Decomposition of the Dry-distillation-products of Calciumoleate, *ibid.*, **45** (1924), 118.
- Sin'iti KAWAI: Synthesis of the Simplest Homologue of Urushiol. I., *Sci. Pap. Inst. Phys. Chem. Research, Japan*, **3** (1925), 263.

- S. KAWAI: Synthesis of the Homologue of Urushiol. II., *ibid.*, **6** (1927), 53.
- S. KAWAI: On a New Reaction between Triacetine and Phenol and an Improved Method for the Preparation of Triacetine, *ibid.*, **3** (1925), 275.
- S. KAWAI: On the Preparation of Catechol-*ortho*-carboxylic acid and the Condensation between Catechol and Glycerol, *ibid.*, **3** (1925), 279.
- S. KAWAI: An Attempt to prepare Higher Unsaturated Alcohols from Certain Drying-oils, *ibid.*, **13** (1930), 254.
- S. KAWAI: 4'-Iodo-biphenyl-4-isocyanate as a Reagent for Alcohols. I. Corresponding Urethanes derived from Fatty Unsaturated Alcohols, *ibid.*, **13** (1930), 260.
- S. KAWAI and Kunisaburo TAMURA: 4'-Iodo-biphenyl-4-isocyanate as a Reagent for Alcohols. II. Corresponding Urethanes derived from C₁~C₁₈-Normal, Saturated, Primary Alcohols, *ibid.*, **13** (1930), 270.
- Taizo KUMAGAI, S. KAWAI, Yoshio SHIKINAMI, and Tatsuo HOSONO: Researches on Hypoglycemia Producing Substances. I. Syntheses of Certain Guanidine Derivatives, *ibid.*, **9** (1928), 271.
- S. KAWAI, T. HOSONO, Y. SHIKINAMI, and Shunichi YONECHI: Researches on Hypoglycemia Producing Substances. II. Pseudo-thiourea, Amidine, and Urea Derivatives, *ibid.*, **16** (1931), 9.
- S. KAWAI: β -Hydroxy-ethylguanidine and its Condensation with Acetoacetic Ester, *ibid.*, **16** (1931), 24.
- Shozo KOBAYASHI: Syntheses of Some Fatty Aromatic Amines Containing Phenolic Hydroxyl Groups in Benzene, *Sci. Pap. Inst. Phys. Chem. Research, Japan*, **6** (1927), 149.
- S. KOBAYASHI: Relation between Chemical Constitution and Pungency in Acid Amides, *ibid.*, **6** (1927), 166.
- S. KOBAYASHI: Double Compounds of α -Unsaturated Acid Amides with Acid and Ammonia, *ibid.*, **6** (1927), 185.
- Munio KOTAKE: Über die Bestandteile des *Laganum* L., *Sci. Pap. Inst. Phys. Chem. Research, Japan*, **6** (1927), 49.
- M. KOTAKE: Über das Krötengift. I. Die Zusammensetzung des chinesischen Arzneimittels "Senso," *ibid.*, (1928), 99.
- M. KOTAKE: Über das Krötengift. II. Die giftigen Bestandteile des Sekretes der japanischen Kröte, *ibid.*, **9** (1928), 108.
- M. KOTAKE: Über das Krötengift. III. Nachtrag der Mitteilung "Über giftige Bestandteile des Sekretes der japanischen Kröte," *ibid.*, **9** (1928), 233.
- M. KOTAKE, Yorisaburo Kimoto: Über das Fett aus *Cypridina*, *Proc. Imp. Acad. Japan*, **6** (1930), 237.
- Tokishige KUSAMA: Pyrogenous Catalytic Oxidation of Naphthalene. Part I, *Bull. Inst. Phys. Chem. Research, Japan*, **2** (1923), 305.
- T. KUSAMA and Masao UNO: The Catalytic Hydrogenation of Naphthalene. Part I, *ibid.*, **6** (1927), 445.
- T. KUSAMA and M. UNO: The Catalytic Hydrogenation of Naphthalene. Part II, *ibid.*, **6** (1927), 984.
- T. KUSAMA: Catalytic Oxidation of Naphthalene, *ibid.*, **7** (1928), 1087.
- Chika KURODA: The Constitution of Carthamin, Part I, II, *J. Chem. Soc. Japan*, **51** (1930), 752, 765.
- C. KURODA: The Colouring Matter of "Awobana." Preliminary Report, *Proc. Imp. Acad. Japan*, **7** (1931), 61.

- C. KURODA: The Colouring Matter of "Awobana." Part II, *ibid.*, **9** (1933), 94.
C. KURODA: The Colouring Matter of "Awobana." Part III, *ibid.*, **11** (1935), 238.
Ichiro MIYAGAWA: Über die Konstitution der Carminsäure, *Mem. Coll. Eng., Kyushu Imp. Univ.*, **6** (1926), 99.
Masuo MURAKAMI: Über die Konstitution des Mangostins, *Ann.*, **496** (1932), 122.
M. MURAKAMI: Über die Konstitution von Fukugetin und Garcinin, *Proc. Imp. Acad. Japan*, **8** (1932), 500.
M. MURAKAMI and Toshi IRIE: Über die chemische Konstitution des Fukugetins, *ibid.*, **10** (1934), 568.
Keizo NAKAMURA: Katalytische Hydrierung des Fluorens und seiner Derivate, *ibid.*, **5** (1930), 469.
K. NAKAMURA: Studien in der Fluorenreihe, *Sci. Pap. Inst. Phys. Chem. Research, Japan*, **14** (1930), 184.
K. NAKAMURA: Studies on Fluorene Derivatives, *Bull. Inst. Phys. Chem. Research, Japan*, **9** (1930), 637.
Matawo NAKANISHI: Investigation on the Soluble Vat Dyes. Part I, *ibid.*, **9** (1930), 429.
M. NAKANISHI: Investigation on the Soluble Vat Dyes. Part II, *ibid.*, **9** (1930), 515.
M. NAKANISHI: Investigations on the Benzanthrone Derivatives. Part I. A New Synthesis of Benzanthrone Derivatives, *ibid.*, **10** (1931), 883.
M. NAKANISHI: Investigations on the Benzanthrone Derivatives. Part II. Derivatives of Bromobenzanthrone, *ibid.*, **10** (1931), 897.
M. NAKANISHI: Benzanthrone, its Derivatives and Related Dyestuffs. I. Nitration Products of Dibromobenzanthrone and Dyestuffs derived from Them, *J. Chem. Soc. Japan*, **55** (1934), 471.
Toyondo NAGAHAMA and Matawo NAKANISHI: Benzanthrone, its Derivatives and Related Dyestuffs. III. Benzanthranyl Mercaptane, Dibenzanthronyl Sulphide and Benzanthranylthioglycollic Acid, *ibid.*, **55** (1934), 480.
M. NAKANISHI: Benzanthrone, its Derivatives and Related Dyestuffs. II. Oxidative Condensation of Benzanthrone, *ibid.*, **55** (1934), 474.
M. NAKANISHI: Benzanthrone, its Derivatives and Related Dyestuffs. IV. The Isolation of Bz-1-chloro-an-2-bz-1'-dibenzanthronyl during the Condensation of Bz-1-chlorobenzanthrone, *ibid.*, **55** (1934), 483.
M. NAKANISHI: Investigations of Benzanthrone with Condensed Heterocyclic Rings, their Derivatives and Dyestuffs derived from Them. I., *ibid.*, **55** (1934), 887.
M. NAKANISHI: Über die Einwirkung von Grignardsche Reagenz auf Benzanthron:—Ein Fall der 1, 6-Addition, *Proc. Imp. Acad. Japan*, **9** (1933), 394.
Tetsuo NOZOE: On the Reduction of Quinoline-2,4-dicarboxylic Acid, *J. Chem. Soc. Japan*, **48** (1927), 147-154; *Proc. Imp. Acad. Japan*, **2** (1926), 541-543.
Terutaro OGATA and Sueo SAKURAI: On the Photosensitive Cyanine Dyes, *Bull. Inst. Phys. Chem. Research, Japan*, **3** (1924), 77.
T. OGATA and S. SAKURAI: On the Optical Research of the Photosensitive Cyanine Dyes, *ibid.*, **3** (1924), 413.
T. OGATA and Keigai SEBE: On Some Photosensitive Dyes, *ibid.*, **4** (1925), 407.
T. OGATA: Studies on Dyes Suitable for Hydrogen-Ion Determinations. Part I. The Determination of Hydrogen-Ion Concentration in Some Standard Solutions and pH Ranges of Cyanine Dyes, *ibid.*, **5** (1926), 237.

- Kotaro SHIMO: Über die Bestandteile des *Phellodendron Amurense*, *Sci. Rep. Tohoku Imp. Univ.*, **10** (1921), 331.
- Shigezo UENO: Studies on the Identification of the Reduction Products of Azo-dyes *Bull. Inst. Phys. Chem. Research, Japan*, **6** (1927), 761.
- S. UENO: Studies on the Identification of the Reduction Products of Azo-dyes. Part II, *ibid.*, **7** (1928), 49.
- S. UENO: Studies on the Identification of the Reduction Products of Azo-dyes. Part III, *ibid.*, **7** (1928), 398.
- S. UENO: Studies on the Identification of the Reduction Products of Azo-dyes. Part IV, *ibid.*, **7** (1928), 467.
- Seishi YAMASHIRO: On the Chemical Constitution of Mangostin, *Bull. Chem. Soc. Japan*, **7** (1932), 1.
-