СЛОВАРЬ ОРГАНИЧЕСКИХ СОЕДИНЕНИЙ

ТОМ

II

СЛОВАРЬ ОРГАНИЧЕСКИХ СОЕДИНЕНИЙ

СТРОЕНИЕ,
ФИЗИЧЕСКИЕ И ХИМИЧЕСКИЕ СВОЙСТВА
ВАЖНЕЙШИХ ОРГАНИЧЕСКИХ СОЕДИНЕНИЙ
И ИХ ПРОИЗВОДНЫХ

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ECCAINE—MYRTILLIN CHLORIDE

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TABLE OF ABBREVIATIONS

A	Acid (A_2, two mols of acid).
A°	Angstrom unit. (10^{-8} cm.).
Abs. EtOH	Absolute alcohol.
AcOH	Acetic acid.
Ac_2O	Acetic anhydride.
AcOEt	Ethyl acetate.
Add.	Additive.
Addn.	Addition.
A.G.F.A.	Aktien-Gesellschaft für Anilinfabrikation.
Alc.	Alcohol, alcoholic.
Alc. NH_3	Alcoholic ammonia.
Alk.	Alkali, alkaline.
[α]	Specific rotation.
Amorph.	Amorphous.
Anhyd.	Anhydrous.
Aq.	Aqueous.
Atm.	Atmosphere(s), atmospheric.
B	Base (B_2, two mols of base).
Badische	Badische Anilin und Sodafabrik.
Belg. P.	Belgian Patent.
B.D.C.	British Dyestuffs Corporation.
Bibl.	Bibliography.
B.p.	Boiling point.
C_p	Constant pressure.
C_v	Constant volume.
Cal.	Calories.
Can. P.	Canadian Patent.
Col.	Colour, coloration.
Comb.	Combustion.
Comp.	Compound.
Conc.	Concentrated.
Corr.	Corrected.
Crit.	Critical.
Cryst.	Crystals, crystalline, crystallise.
$(COOH)_2$	Oxalic acid.
$(CH_2COOH)_2$	Succinic acid.
D	Density.
d	Dextrorotatory.
dl	Racemic. Optically inactive by external compensation.
Decomp.	Decomposed, decomposition.
Deriv.	Derivative.
Dil.	Dilute, dilution.
Diss.	Dissolves, dissolved.
Dist.	Distil, distillation.
D.R.P.	German Patent.
E.P.	English (British) Patent.
Et	Ethyl.
Et_2O	Ether (diethyl ether).
EtOH	Ethyl alcohol.
Fluor.	Fluoresces, fluorescence.
F.p.	Freezing point.
F.P.	French Patent.
Form.	Formation.
γ	10^{-6} gm. or 10^{-3} mgm. (microgrammes).
gm.	Gramme(s).
Hyd.	Hydrolyses, hydrolysed, hydrolysis.
i	Optically inactive by internal compensation.
I.C.I.	Imperial Chemical Industries.
I.G.	Interessen Gemeinschaft Farbenindustrie Aktien-Gesellschaft.
Insol.	Insoluble.
I.U.	International Unit.
Jap. P.	Japanese Patent.
k	Dissociation constant.
l	Lævorotatory.
Liq.	Liquid.
m	Meta (position).
Max.	Maximum.
Me	Methyl.
MeOH	Methyl alcohol.
Me_2CO	Acetone.
Min.	Mineral (inorganic).
Misc.	Miscible.
M.L.B.	Meister, Lucius, & Brüning.
mm.	Millimetres.
Mod.	Moderately.
Mol.	Molecule, molecular, molar.
M.p.	Melting point.
ms	Meso (position).
MW	Molecular weight (formula weight).
mgm.	Milligramme(s).
mμ	Millimicron. (10^{-7} cm.).
n	Normal (chain).
n_D	Refractive index (D line, etc.).
NaHg	Sodium amalgam.
NH_3	Ammonia, aqueous ammonia.
$NH_3.AgNO_3$	Ammoniacal silver nitrate.
o	Ortho (position).
Ord.	Ordinary.
Org.	Organic.
Ox.	Oxidise, oxidation.
p	Para (position).
P	Patent.
Part.	Partly, partial.
Pet. ether	Petroleum ether.
$PhNO_2$	Nitrobenzene.
PhOH	Phenol.
Ppd.	Precipitated.
Ppt.	Precipitate.
Pptn.	Precipitation.
Prac.	Practically.
Press.	Pressure(s).
ψ	Pseudo.
Py	Pyridine.
r	Racemic.
Red.	Reduce, reduction.
Ref.	Reference.
Russ.P.	Russian Patent.
S.C.I.	Societé pour l'industrie chimique à Basle.
Sec.	Secondary.
Sol.	Soluble, solution.
Spar.	Sparingly.
Sp. gr.	Specific gravity.
Sp. heat	Specific heat.
Suppl.	Supplement.
Sym.	Symmetrical.
Temp.	Temperature(s).
Tert.	Tertiary.
Undecomp.	Undecomposed.
Unsym.	Unsymmetrical.
UV.	Ultraviolet.
Vac.	Vacuum.
Vap.	Vaporisation.
Vol.	Volume.

JOURNAL ABBREVIATIONS

Journals not listed here are given their full titles in the text.

Acta Phytochim.	Acta Phytochimica (Japan).
Am. Chem. J.	American Chemical Journal.
Am. J. Pharm.	American Journal of Pharmacy.
Am. J. Sci.	American Journal of Science.
Anales soc. españ fis. quim.	Anales de la sociedad española de física y química.
Angew. Chem.	Angewandte Chemie.
Ann.	Annalen der Chemie.
Ann. chim.	Annales de chimie.
Ann. chim. applicata	Annali di chimica applicata.
Ann. chim. phys.	Annales de chimie et de physique.
Ann. phys.	Annales de physique.
Ann. Physik	Annalen der Physik.
Ann. Rev. Biochem.	Annual Review of Biochemistry.
Arch. Pharm.	Archiv der Pharmazie (und Berichte der deutschen pharmazeutischen Gesellschaft).
Arkiv Kemi, Mineral. Geol.	Arkiv för Kemi, Mineralogi och Geologi.
Atti accad. Lincei	Atti della reale accademia nazionale dei Lincei.
Ber.	Berichte der deutschen chemischen Gesellschaft.
Ber. deut. pharm. Ges.	Berichte der deutschen pharmazeutischen Gesellschaft.
Ber. ges. Physiol. exptl. Pharmakol.	Berichte über die gesamte Physiologie und experimentelle Pharmakologie.
Biochem. J.	Biochemical Journal.
Biochem. Z.	Biochemische Zeitschrift.
Biol. Zentr.	Biologisches Zentralblatt.
Brit. Chem. Abstracts	British Chemical Abstracts.
Bull. Chem. Soc. Japan	Bulletin of the Chemical Society of Japan.
Bull. Imp. Inst.	Bulletin of the Imperial Institute.
Bull. Inst. Phys. Chem. Research (Tokyo).	Bulletin of the Institute of Physical and Chemical Research, Toyko.
Bull. sci. acad. roy. Belg.	Bulletin de la classe des sciences, academie royale de Belgique.
Bull. sci. pharmacol.	Bulletin des sciences pharmacologiques.
Bull. soc. chim.	Bulletin de la société chimique de France.
Bull. soc. chim. Belg.	Bulletin de la société chimique de Belgique.
Bull. soc. chim. biol.	Bulletin de la société de chimie biologique.
Can. Chem. Met.	Canadian Chemistry and Metallurgy.
Can. J. Research	Canadian Journal of Research.
Chem. Abstracts	Chemical Abstracts (of the American Chemical Society).
Chem. Ind.	Die Chemische Industrie.
Chem. Met. Eng.	Chemical and Metallurgical Engineering.
J. Indian Chem. Soc.	Journal of the Indian Chemical Society.
J. Indian Inst. Sci.	Journal of the Indian Institute of Science.
Chem. News	Chemical News (and Journal of Industrial Science).
Chem.-Tech. Rundschau	Chemische-Technische Rundschau.
Chem. Trade J.	Chemical Trade Journal (and Chemical Engineer).
Chem. Umschau	Chemische Umschau (auf dem Gebiete der Fette, Oele, Wachse, und Harze). Now Fettchemische Umschau.
Chem. Weekblad	Chemisch Weekblad.
Chem. Zentr.	Chemisches Zentralblatt.
Chem.-Ztg.	Chemiker-Zeitung.
Compt. rend.	Comptes rendus (hebdomadaires des séances de l'académie des sciences).
Compt. rend. acad. sci. U.R.S.S.	Comptes rendus de l'Académie des Sciences de l'U.R.S.S.
Compt. rend. soc. biol.	Comptes rendus des séances de la société de biologie.
Dinglers polytech. J.	Dinglers polytechnisches Journal.
Fettchem. Umschau	Fettchemische Umschau.
Gazz. chim. ital.	Gazzetta chimica italiana.
Giorn. chim. applicata	Giornale di chimica applicata.
Giorn. chim. ind.	Giornale di chimica industriale.
Giorn. chim. ind. applicata	Giornale di chimica industriale ed applicata.
Helv. Chim. Acta	Helvetica Chimica Acta.
Ind. Eng. Chem.	Industrial and Engineering Chemistry.
Jahresber. Fortschr. Chem.	Jahresbericht über die Fortschritte der Chemie.
J. Am. Chem. Soc.	Journal of the American Chemical Society.
J. Am. Pharm. Assocn.	Journal of the American Pharmaceutical Association.
J. Applied Chem., U.S.S.R.	Journal of Applied Chemistry, U.S.S.R.
Japan. J. Chem.	Japanese Journal of Chemistry.
J. Bact.	Journal of Bacteriology.
J. Biochem. Japan.	Journal of Biochemistry of Japan.
J. Biol. Chem.	Journal of Biological Chemistry.
J. Chem. Education	Journal of Chemical Education.
J. Chem. Ind. Japan	Journal of Chemical Industry (Japan). Now J. Soc. Chem. Ind. Japan.
J. Chem. Physics	Journal of Chemical Physics.
J. Chem. Soc.	Journal of the Chemical Society (London).
J. Chem. Soc. Abstracts	Abstracts of the Chemical Society (London).
J. Chem. Soc. Japan	Journal of the Chemical Society of Japan.
J. chim. phys.	Journal de chimie physique.
J. Chinese Chem. Soc.	Journal of the Chinese Chemical Society.
J. Gen. Chem. U.S.S.R.	Journal of General Chemistry, U.S.S.R.
Proc. Chem. Soc.	Proceedings of the Chemical Society (London).
Proc. Roy. Soc.	Proceedings of the Royal Society (London).

J. Org. Chem.	Journal of Organic Chemistry.
J. Pharmacol.	Journal of Pharmacology and Experimental Therapeutics.
J. pharm. Belg.	Journal de pharmacie de Belgique.
J. pharm. chim.	Journal de pharmacie et de chimie.
J. Pharm. Soc. Japan	Journal of the Pharmaceutical Society (Japan).
J. Phys. Chem.	Journal of Physical Chemistry.
J. prakt. Chem.	Journal für praktische Chemie.
J. Proc. Roy. Soc. N.S. Wales	Journal and Proceedings of the Royal Society of New South Wales.
J. Russ. Phys.-Chem. Soc.	Journal of the Russian Physical-Chemical Society.
J. Soc. Chem. Ind.	Journal of the Society of Chemical Industry.
J. Soc. Chem. Ind. Japan	Journal of the Society of Chemical Industry (Japan).
J. Soc. Dyers Colourists	Journal of the Society of Dyers and Colourists.
Monatsh.	Monatshefte für Chemie und verwandte Teile anderer Wissenschaften.
Mem. Coll. Sci., Kyoto Imp. Univ.	Memoirs of the College of Science, Kyoto Imperial University.
Naturwiss.	Naturwissenschaften.
Org. Chem. Ind. U.S.S.R.	Promischlennosti Organitscheskoi Chimii, U.S.S.R.
Pharm. J.	Pharmaceutical Journal and Pharmacist.
Pharm. Ztg.	Die deutsche Pharmazeutische Zeitung.
Pharm. Zentralhalle.	Pharmazeutische Zentralhalle.
Phil. Mag.	Philosophical Magazine and Journal of Science.
Proc. Acad. Sci., Amsterdam	Proceedings of the Royal Academy of Sciences of Amsterdam.
Proc. Imper. Acad., Tokyo	Proceedings of the Imperial Academy, Tokyo.
Quart. J. Indian Chem. Soc.	Quarterly Journal of the Indian Chemical Society.
Quart. J. Pharm. Pharmacol.	Quarterly Journal of Pharmacy and Pharmacology.
Rec. trav. chim.	Recueil des travaux chimiques des Pays-Bas.
Rev. chim. ind.	Revue de chimie industrielle.
Rev. prod. chim.	Revue des produits chimiques.
Sci. Papers Inst. Phys. Chem. Research, Tokyo	Scientific Papers of the Institute of Physical and Chemical Research (Tokyo).
Sci. reps. Natl. Tsinghua Univ.	Science Reports of the National Tsinghua University.
Sci. reps. Natl. Univ. Peking	Science Reports of the National University of Peking.
Sitzb. Akad. Wiss. Wien	Sitzungsberichte Akademie der Wissenschaften in Wien.
Trans. Faraday Soc.	Transactions of the Faraday Society.
Trans. Roy. Soc.	Transactions of the Royal Society (London).
Trans. Roy. Soc. Canada.	Transactions of the Royal Society of Canada.
Z. anal. Chem.	Zeitschrift für analytische Chemie.
Z. angew. Chem.	Zeitschrift für angewandte Chemie. Now Angewandte Chemie.
Z. anorg. allgem. Chem.	Zeitschrift für anorganische und allgemeine Chemie.
Z. Chem.	Zeitschrift für Chemie.
Z. Elektrochem.	Zeitschrift für Elektrochemie und angewandte physikalische Chemie.
Z. ges Naturwiss.	Zeitschrift für die gesamte Naturwissenschaft.
Z. physik. Chem.	Zeitschrift für physikalische Chemie.
Z. physiol. Chem.	Zeitschrift für physiologische Chemie (Hoppe-Seyler).

LIST OF SUBSTITUENTS

In the following table is given a list of the principal substituent groups as they are used in the dictionary.

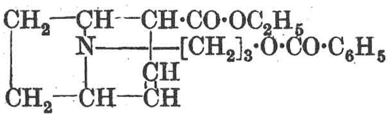
1	—F	Fluoro
2	—Cl	Chloro
3	—Br	Bromo
4	—I	Iodo
5	—NO	Nitroso
6	$—NO_2$	Nitro
7	—N=N⇀N	Azido, Triazo
8	—OH	Hydroxy (*followed by* $—OCH_3$ Methoxy, $—OC_2H_5$ Ethoxy, $—O·CH_2·O—$ methylenedioxy, $—OC_6H_5$ Phenoxy, $—O·CO·CH_3$, Acetoxy, *etc. in the order of the group attached to the oxygen*)
9	—SH	Mercapto
10	—SO	Thionyl
11	$—SO_2$	Sulphonyl
12	—SCN	Thiocyano
13	=O (in C—CO—C)	Keto
14	>NH	Imino
15	=N·OH	Isonitroso, Oximino
16	—S—	Thio
17	$—SO_3H$	Sulpho
18	$—NH_2$	Amino
19	$—NH·C_6H_5$	Anilino, Phenylimino
20	$—NH·C_6H_4·CH_3$	Toluidino
21	$—NH·CO·NH_2$	Ureido
22	$—NH·C(:NH)·NH_2$	Guanidino
23	—NH·OH	Hydroxylamino
24	$—NH·NH_2$	Hydrazino
25	—NH·NH—	Hydrazo
26	—N:N—	Azo
27	·N:N]·X	Diazonium, Diazo (X = OH, Cl, etc.)
28	—N=N— with Ö on N (—N=N— with ↓ O)	Azoxy
29	—As:As—	Arseno
30	—NH·N:N— (*open*)	Diazoamino
31	—NH·N:N— (*cyclic*)	Azimino
32	$—CH_3$	Methyl
33	$—CH_2OH$	Hydroxymethyl, Methylol
34	$—C_2H_5$	Ethyl

35	$-CH_2\cdot CH_2\cdot CH_3$	*n*-Propyl
36	$-CH(CH_3)_2$	Isopropyl
37	$-CH_2\cdot CH_2\cdot CH_2\cdot CH_3$	*n*-Butyl
38	$-CH_2\cdot CH(CH_3)_2$	Isobutyl
39	$-C(CH_3)_3$	*ert.*-Butyl
40	$-CH_2\cdot [CH_2]_3\cdot CH_3$	*n*-Amyl
41	$-CH(C_2H_5)_2$	*sec.-n*-Amyl
42	$-CH_2\cdot CH_2\cdot CH(CH_3)_2$	Isoamyl
43	$-CH_2\cdot CH\left\langle\begin{smallmatrix}CH_3\\ C_2H_5\end{smallmatrix}\right.$	*active* Amyl
44	$-C\left\langle\begin{smallmatrix}CH_3\\ C_2H_5\\ CH_3\end{smallmatrix}\right.$	*tert.*-Amyl
45	$-CH_2\cdot [CH_2]_4\cdot CH_3$	*n*-Hexyl
46	$-CH_2\cdot [CH_2]_3\cdot CH(CH_3)_2$	Isohexyl
47	$-CH_2\cdot [CH_2]_5\cdot CH_3$	*n*-Heptyl, Oenanthyl
48	$-CH_2\cdot [CH_2]_3\cdot CH(CH_3)_2$	Isoheptyl
49	$-CH_2\cdot [CH_2]_6\cdot CH_3$	Octyl, Capryl
50	$-CH_2\cdot [CH_2]_7\cdot CH_3$	Nonyl
51	$-CH_2\cdot [CH_2]_8\cdot CH_3$	Decyl
52	$-CH_2\cdot [CH_2]_9\cdot CH_3$	Undecyl
53	$-CH_2\cdot [CH_2]_{10}\cdot CH_3$	Dodecyl
54	$-CH_2\cdot [CH_2]_{11}\cdot CH_3$	Tridecyl
55	$-CH_2\cdot [CH_2]_{12}\cdot CH_3$	Tetradecyl
56	$-CH_2\cdot [CH_2]_{13}\cdot CH_3$	Pentadecyl
57	$-CH_2\cdot [CH_2]_{14}\cdot CH_3$	Cetyl, Hexadecyl
58	$-CH_2\cdot [CH_2]_{15}\cdot CH_3$	Heptadecyl
59	$-CH_2\cdot [CH_2]_{16}\cdot CH_3$	Octadecyl
60	$-CH_2\cdot [CH_2]_{18}\cdot CH_3$	Eicosyl
61	$-CH_2\cdot [CH_2]_{24}\cdot CH_3$	Ceryl
62	$-CH_2\cdot [CH_2]_{28}\cdot CH_3$	Myricyl, Melissyl
63	$-CH\left\langle\begin{smallmatrix}CH_2\\ \vert\\ CH_2\end{smallmatrix}\right.$	Cyclopropyl (*followed by* Cyclobutyl, Cyclopentyl, Cyclohexyl, Cycloheptyl (Suberyl) *in that order*)
64	$-CH{:}CH_2$	Vinyl
65	$-CH{:}CH\cdot CH_3$	Propenyl
66	$-C({:}CH_2)\cdot CH_3$	Isopropenyl
67	$-CH_2\cdot CH{:}CH_2$	Allyl
68	$-CH{:}CH\cdot CH_2\cdot CH_3$	*α*-Butenyl
69	$-CH_2\cdot CH{:}CH\cdot CH_3$	*β*-Butenyl, Crotyl
70	$-CH_2\cdot CH_2\cdot CH{:}CH_2$	*γ*-Butenyl, Allylomethyl
71	$-CH_2\cdot [CH_2]_7\cdot CH{:}CH\cdot [CH_2]_7\cdot CH_3$	Octadecenyl
72	$-C\vdots CH$	Acetylenyl, Ethinyl
73	$-CH_2\cdot C\vdots CH$	Propargyl
74	$-C_6H_5$	Phenyl
75	$-C_6H_4\cdot CH_3$	Tolyl
76	$-CH_2\cdot C_6H_5$	Benzyl
77	$-CH_2\cdot C_6H_4\cdot OH$ (*-o*)	Salicyl
78	$-CH_2\cdot C_6H_4\cdot OCH_3$ (*-p*)	Anisyl
79	$-CH_2\cdot CH_2\cdot C_6H_5$	Phenylethyl
80	$-CH_2\cdot C_6H_4\cdot CH_3$	Xylyl
81	$-C_6H_4\cdot CH(CH_3)_2$	Cumyl
82	$-C_6H_2(CH_3)_3$ (1 : 2 : 4)	*ψ*-Cumyl
83	$-C_6H_2(CH_3)_3$ (1 : 3 : 5)	Mesityl
84	$-CH{:}CH\cdot C_6H_5$	Styryl
85	$-CH_2\cdot CH{:}CH\cdot C_6H_5$	Cinnamyl
86	$-C_{10}H_7$	Naphthyl
87	$-C_6H_4\cdot C_6H_5$	Diphenylyl, Xenyl
88	$-CH(C_6H_5)_2$	Benzhydryl, Diphenylmethyl
89	$-C_{14}H_9$	Anthryl, anthranyl
90	$-C_{14}H_9$	Phenanthryl
91	$-C(C_6H_5)_3$	Triphenylmethyl
92	$-CH_2\cdot CH_2-$	Ethylene, Dimethylene
93	$-CH(CH_3)\cdot CH_2-$	Propylene
94	$-CH_2\cdot CH_2\cdot CH_2-$	Trimethylene
95	$-CH_2\cdot CH_2\cdot CH_2\cdot CH_2-$	Tetramethylene
96	$-C(CH_3)_2\cdot CH_2-$	Isobutylene
97	$-CH_2\cdot [CH_2]_3\cdot CH_2-$	Pentamethylene
98	$-CH_2[\cdot CH_2]_4\cdot CH_2-$	Hexamethylene
99	$-CH_2\cdot [CH_2]_5\cdot CH_2-$	Heptamethylene
100	$-CH_2\cdot [CH_2]_6\cdot CH_2-$	Octamethylene
101	$-CH{:}CH-$	Vinylene
102	$-C_6H_4-$	Phenylene
103	$-C_6H_3(CH_3)-$	Tolylene
104	$-CH_2-$	Methylene
105	$=CH\cdot CH_3$	Ethylidene
106	$=CH\cdot CH_2\cdot CH_3$	Propylidene
107	$=C(CH_3)_2$	Isopropylidene
108	$=CH\cdot CH_2\cdot CH_2\cdot CH_3$	Butylidene
109	$=CH\cdot CH(CH_3)_2$	Isobutylidene
110	$H_2C\left\langle\begin{smallmatrix}CH_2-CH_2\\ CH_2-CH_2\end{smallmatrix}\right\rangle C=$	Cyclohexylidene
111	$=C{:}CH_2$	Vinylidene
112	$=CH\cdot CH{:}CH_2$	Allylidene
113	$CH_3\cdot CH{:}CH\cdot CH=$	Crotylidene
114	$=CH\cdot C_6H_5$	Benzylidene
115	$=CH\cdot C_6H_4\cdot OH$ (*-o*)	Salicylidene
116	$=CH\cdot C_6H_4\cdot OCH_3$ (*-p*)	Anisylidene
117	$=CH\cdot C_6H_4\cdot CH(CH_3)_2$ (*-p*)	Cuminylidene
118	$=CH\cdot CH{:}CH\cdot C_6H_5$	Cinnamylidene
119	$-CH_2\cdot CO\cdot CH_3$	Acetonyl
120	$-CH_2\cdot CO\cdot C_6H_5$	Phenacyl
121	$-CH_2\cdot CO\cdot C_6H_4\cdot CH_3$	Tolacyl
122	$C_6H_5\cdot \underset{\vert}{C}H\cdot CO\cdot C_6H_5$	Desyl
123	$-CHO$	Aldehydo, Formyl
124	$\equiv CH$	Methinyl
125	$-CO\cdot CH_3$	Acetyl, Aceto
126	$-CO\cdot CH_2\cdot CH_3$,	Propionyl
127	$-CO\cdot CH_2\cdot CH_2\cdot CH_3$	Butyryl
128	$-CO\cdot CH(CH_3)_2$	Isobutyryl
129	$-CO\cdot CH_2\cdot [CH_2]_2\cdot CH_3$	Valeryl
130	$-CO\cdot CH_2\cdot CH(CH_3)_2$	Isovaleryl
131	$-CO\cdot CH_2\cdot [CH_2]_3\cdot CH_3$	Caproyl
132	$-CO\cdot CH_2\cdot [CH_2]_{13}\cdot CH_3$	Palmityl
133	$-CO\cdot CH_2\cdot [CH_2]_{15}\cdot CH_3$	Stearyl
134	$-CO\cdot [CH_2]_7\cdot CH{:}CH\cdot [CH_2]_7\cdot CH_3$	Oleyl
135	$-CO\cdot C_6H_5$	Benzoyl
136	$-CO\cdot C_6H_4\cdot OH$ (*-o*)	Salicyloyl
137	$-CO\cdot C_6H_4\cdot OCH_3$ (*-p*)	Anisoyl
138	$-CO\cdot CH_2\cdot C_6H_5$	Phenylacetyl
139	$-CO\cdot C_6H_4\cdot CH_3$	Toluyl
140	$-CO\cdot CH{:}CH\cdot C_6H_5$	Cinnamoyl
141	$-CO\cdot C_{10}H_7$	Naphthoyl
142	$-CO\cdot CO-$	Oxalyl
143	$-CO\cdot CH_2\cdot CO-$	Malonyl
144	$-CO\cdot CH_2\cdot CH_2\cdot CO-$	Succinyl
145	$-CO\cdot C_6H_4\cdot CO-$	Phthaloyl, Isophthaloyl, Terephthaloyl
146	$-COOH$ ($-CO\cdot OCH_3$, $-CO\cdot OC_2H_5$, etc.)	Carboxy, (Carbomethoxy, Carbethoxy, etc.)
147	$-CO\cdot NH_2$	Carbamyl
148	$>CO$	Carbonyl
149	$-C({:}NH)\cdot NH_2$	Guanyl
150	$-CN$	Cyano
151	$-CO\cdot CH_2NH_2$	Glycyl
152	$-CO\cdot CH(NH_2)\cdot CH_3$	*α*-Alanyl
153	$-CO\cdot CH_2\cdot CH_2NH_2$	*β*-Alanyl
154	$-CO\cdot CH(NH_2)\cdot CH(CH_3)_2$	Valyl
155	$-CO\cdot CH(NH_2)\cdot CH_2\cdot CH(CH_3)_2$	Leucyl
156	$-CO\cdot CH_2\cdot NH\cdot CO\cdot C_6H_5$	Hippuryl
157	$-C_4H_3O$	Furyl
158	$-C_4H_3S$	Thienyl
159	$-CH_2\cdot C_4H_3O$	Furfuryl
160	$=CH\cdot C_4H_3O$	Furfurylidene
161	$-CO\cdot C_4H_3O$	Furoyl, Pyromucyl
162	$-C_4H_3NH$	Pyrryl
163	$-C_5H_4N$	Pyridyl

DICTIONARY OF ORGANIC COMPOUNDS

E

Eccaine



$C_{20}H_{25}O_4N$ MW, 343

Oil. Non-toxic anæsthetic.

B,HCl : cryst. from EtOH-Et_2O. M.p. 117°. Sol. H_2O.

B,H_2PtCl_6 : m.p. 69–70°.

Picrate : m.p. 139–41°.

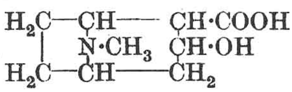
Methiodide : m.p. 194–5°.

v. Braun, Müller, *Ber.*, 1918, **51**, 251.

Ecgonidine.

See Anhydroecgonine.

Ecgonine



$C_9H_{15}O_3N$ MW, 185

l-.

Prisms + $1H_2O$ from EtOH.Aq. M.p. 198° decomp. M.p. anhyd. 205°. Sol. H_2O, EtOH. Insol. Et_2O. $[\alpha]_D$ −45·4°. $KMnO_4$ ⟶ nor-*l*-ecgonine.

Me ester : $C_{10}H_{17}O_3N$. MW, 199. Prisms from EtOH. M.p. 212° decomp. *Methiodide* : m.p. 164°. $[\alpha]_D^{20}$ −17·6°.

Amide : $C_9H_{16}O_2N_2$. MW, 184. Prisms or plates from EtOH. M.p. 198°. Sol. H_2O. Insol. Et_2O, Me_2CO, C_6H_6. *Hydrochloride* : m.p. 275° decomp. *Chloroplatinate* : m.p. 239° decomp. *Picrate* : needles from EtOH.Aq. M.p. 150°. *Methiodide* : m.p. 203°.

B,HCl : plates. M.p. 246°. $[\alpha]_D$ −57°.

B_2,H_2PtCl_6 : m.p. 226°.

Benzoyl : needles from H_2O. M.p. anhyd. 195°. $[\alpha]_D$ −63·3° in H_2O. *Me ester* : *see* β-Cocaine. *Et ester* : Homococaine, cocaethyline. Prisms from Et_2O. M.p. 108–9°. Similar to cocaine but less toxic. Not mydriatic.

dl-.

Plates +$3H_2O$ from EtOH.Aq. M.p. 93–118°, anhyd. 203° (212° rapid heat.).

Me ester : *hydrochloride*, m.p. 195°. *Methiodide* : m.p. 162°.

B_2,HCl : plates. M.p. 247°.

Chloroaurate : needles. M.p. 205°.

Willstätter, Bode, *Ann.*, 1902, **326**, 61, 76.
Willstätter, Wolfes, Mäder, *Ann.*, 1923, **434**, 111.
Liebermann, *Ber.*, 1888, **21**, 2351.
Liebermann, Giesel, *ibid.*, 3197.
Einhorn, Norwall, *Ber.*, 1893, **26**, 963.

ψ-Ecgonine

$C_9H_{15}O_3N$ MW, 185

d-.

Cryst. from EtOH. M.p. 254° (264°).

Me ester : $C_{10}H_{17}O_3N$. MW, 199. Cryst. from Et_2O. M.p. 115°. $[\alpha]_D^{20}$ +19·5° in H_2O. *B,HCl* : $[\alpha]_D^{20}$ +23·67° in H_2O.

B,HCl : prisms. M.p. 236°. $[\alpha]_D$ +1·6°.

B,$HAuCl_4$: m.p. 220° decomp.

Methiodide : leaflets from MeOH. M.p. 209°.

l-.

Me ester : m.p. 115°.

r-.

Cryst. from EtOH. M.p. 251° decomp. Sol. H_2O. Spar. sol. EtOH.

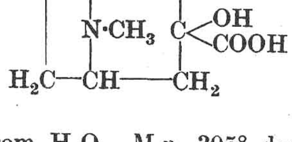
Me ester : prisms. M.p. 125–6°. *Methiodide* : needles from EtOH. M.p. 182–5°.

B,HCl,½H_2O : needles. M.p. 149°.

Chloroaurate : needles. M.p. 213° decomp.

Willstätter, Wolfes, Mäder, *Ann.*, 1923, **434**, 124.
Einhorn, Marquardt, *Ber.*, 1890, **23**, 468.
Willstätter, Bode, *Ber.*, 1901, **34**, 1457.

α-Ecgonine



$C_9H_{15}O_3N$ MW, 185

Cryst. from H_2O. M.p. 305° decomp. Sol. H_2O, EtOH.Aq.

Me ester: $C_{10}H_{17}O_3N$. MW, 199. Prisms from Me_2CO or AcOEt. M.p. 114°. Sol. H_2O, EtOH, $CHCl_3$. Spar. sol. Et_2O. *$B_2,H_2PtCl_6,2H_2O$*: m.p. 204°. *$B,HAuCl_4$*: orange-yellow leaflets from H_2O. M.p. 95–6°. *Methiodide*: needles from MeOH. M.p. 201–2°. *Picrate*: m.p. 189–91°.

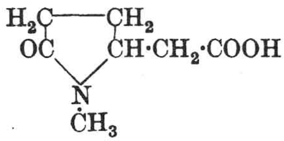
Benzoyl: cryst. from H_2O. M.p. 209° decomp. *Me ester*: *see* α-Cocaine.

B_2,H_2PtCl_6: m.p. 223–4° decomp.

$B,HAuCl_4,H_2O$: m.p. 183–4° decomp.

Willstätter, *Ber.*, 1896, **29**, 2216.

Ecgoninic Acid (N-*Methyl-2-pyrrolidone-5-acetic acid*)



$C_7H_{11}O_3N$ MW, 157

l-.

Prisms from AcOEt. M.p. 117–18°. Sol. AcOEt, Me_2CO, $CHCl_3$. Spar. sol. C_6H_6.

Me ester: $C_8H_{13}O_3N$. MW, 171. B.p. 275°/13·5 mm.

r-.

Leaflets from AcOEt–C_6H_6. M.p. 93–5°. More soluble than *l*-form.

Ag salt: needles from H_2O. M.p. 240° decomp.

Willstätter, Bode, *Ber.*, 1901, **34**, 519.
Willstätter, Hollander, *ibid.*, 1818.

Echicerin

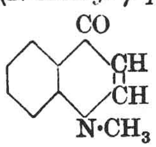
$C_{30}H_{48}O_2$ MW, 440

Constituent of *Echites scholaris*, Linn. Needles from EtOH. M.p. 157°. Sol. EtOH, Et_2O, $CHCl_3$, C_6H_6. $[\alpha]_D$ +63·75°. Na in pet. ether ⟶ amorphous acid, $C_{30}H_{46}O_4$. Sol. conc. H_2SO_4 to yellow sol.

Bromide: needles from EtOH. M.p. 116°.

Jobst, Hesse, *Ann.*, 1875, **178**, 58.

Echinopsine (N-*Methyl-γ-quinolone*)



$C_{10}H_9ON$ MW, 159

Alkaloid from seeds of *Echinops Ritro.*

α-.

Cryst. from EtOH. M.p. 152°. Sol. H_2O, EtOH, $CHCl_3$. Spar. sol. Et_2O.

B,HCl: m.p. 185–6°.

B,H_2PtCl_6: m.p. 210–12.°

Picrate: m.p. 223–4°.

β-.

Cryst. from EtOH. M.p. 135°.

Greshoff, *Rec. trav. chim.*, 1900, **19**, 360.
Späth, Kolbe, *Monatsh.*, 1923, **43**, 469.

Echitamidine

$C_{20}H_{26}O_3N_2$ MW, 342

Constituent of bark of *Alstonia congensis*. Plates from Et_2O. M.p. 244° decomp. (*B,H_2O*: m.p. 135°.) Sol. H_2O, EtOH. $[\alpha]_D^{16}$ −515° in EtOH. Conc. HNO_3 ⟶ blue col. ⟶ yellow col.

B,HCl: m.p. 179° decomp.

B,HBr: m.p. 181° decomp.

B_2,H_2SO_4: m.p. 169° decomp.

Picrate: m.p. 226·7° decomp.

Goodson, *J. Chem. Soc.*, 1932, 2628.

Echitamine (*Ditaine*)

$C_{22}H_{28}O_4N_2$ MW, 384

Principal constituent of bark of *Alstonia congensis*. Prisms $+4H_2O$ from EtOH. Loses $3H_2O$ at 105°. *B,H_2O*, m.p. 206°. Sol. H_2O, EtOH, Et_2O. Insol. pet. ether. $[\alpha]_D^{20}$ −28·8° in EtOH. Conc. H_2SO_4 ⟶ purple-red col.

B,HCl: m.p. 295°. *Acetate*:

$$C_{22}H_{26}O_4N_2(O{\cdot}COCH_3)_2,HCl.$$

M.p. 271°.

B,HBr: m.p. 183°.

Goodson, Henry, *J. Chem. Soc.*, 1925, **127**, 1640.
Hesse, *Ann.*, 1880, **203**, 144.
Harnack, *Ber.*, 1880, **13**, 1648.

Eicosane (*Didecyl*)

$$CH_3{\cdot}CH_2{\cdot}[CH_2]_{16}{\cdot}CH_2{\cdot}CH_3$$

$C_{20}H_{42}$ MW, 282

Leaflets from EtOH. M.p. 36–7°. B.p. 205°/15 mm. $D^{36\cdot7}$ 0·7779.

Krafft, *Ber.*, 1886, **19**, 2220.
Carothers, Hill, Kirby, Jacobson, *J. Am. Chem. Soc.*, 1930, **52**, 5280.

***n*-Eicosanic Acid** (*Arachidic acid*, n-*nonadecane*-1-*carboxylic acid, eicosoic acid, eicosanoic acid*)

$$CH_3{\cdot}CH_2{\cdot}[CH_2]_{16}{\cdot}CH_2{\cdot}COOH$$

$C_{20}H_{40}O_2$ MW, 312

Constituent of *Cascara sagrada*, and of arachis (earth-nut, pea-nut) oil as glyceride. Plates from EtOH. M.p. 77° (75°). B.p. 203–

5°/1 mm. Sol. Et_2O, $CHCl_3$, hot EtOH. D^{100} 0·8240. n_D^{100} 1·425.

Me ester: $C_{21}H_{42}O_2$. MW, 326. M.p. 54·5° (46–7°).

Et ester: $C_{22}H_{44}O_2$. MW, 340. M.p. 50° (42°). B.p. 295–7°/100 mm.

Phenyl ester: $C_{26}H_{44}O_2$. MW, 388. M.p. 58·5°.

Anhydride: $C_{40}H_{78}O_3$. MW, 606. M.p. 77·5°.

Amide: $C_{20}H_{41}ON$. MW, 311. M.p. 108–9°.

Nitrile: $C_{20}H_{39}N$. MW, 293. M.p. 49·5°.

Bleyburg, Ulrich, *Ber.*, 1931, **64**, 2512.
Adam, Dyer, *J. Chem. Soc.*, 1925, **127**, 72.

Eicosanoic Acid.
See Eicosanic Acid.

Eicosanol.
See Eicosyl Alcohol.

Eicosanone-3.
See Ethyl *n*-heptadecyl Ketone.

Eicosanone-7.
See *n*-Hexyl *n*-tridecyl Ketone.

Eicosenic Acid

$CH_3·[CH_2]_7·CH:CH·[CH_2]_9·COOH$

$C_{20}H_{38}O_2$ MW, 310

Cryst. from EtOH. M.p. 50°. B.p. 267°/15 mm.

Bodenstein, *Ber.*, 1894, **27**, 3403.

Eicosoic Acid.
See Eicosanic Acid.

Eicosyl Alcohol (1-*Hydroxyeicosane, eicosanol, arachidic alcohol*)

$CH_3·CH_2·[CH_2]_{16}·CH_2·CH_2OH$

$C_{20}H_{42}O$ MW, 298

Wax. M.p. 65·5° (71°). B.p. 220°/3 mm. Sol. hot pet. ether, hot C_6H_6. Ox. ⟶ arachidic acid.

Acetyl: m.p. 40°.

Adam, Dyer, *J. Chem. Soc.*, 1925, **127**, 71.
Levene, Taylor, *J. Biol. Chem.*, 1924, **59**, 905.
Haller, *Compt. rend.*, 1907, **144**, 597.

Eicosyl iodide (1-*Iodoeicosane*)

$CH_3·CH_2·[CH_2]_{16}·CH_2·CH_2I$

$C_{20}H_{41}I$ MW, 409

Cryst. from Me_2CO. M.p. 42–3°. Zn + HCl ⟶ eicosane.

Levene, West, van der Scheer, *J. Biol. Chem.*, 1915, **20**, 526.
Levene, Taylor, *J. Biol. Chem.*, 1924, **59**, 916.

Eicosylmalonic Acid.
See Heneicosane-1 : 1-dicarboxylic Acid.

Eikonogen.
See 1-Amino-2-naphthol-6-sulphonic Acid.

Elæomargaric Acid.
See Elæostearic Acid.

Elæostearic Acid (*Elæomargaric Acid*)

$CH_3·[CH_2]_3·[CH:CH]_3·[CH_2]_7·COOH$

$C_{18}H_{30}O_2$ MW, 278

α- or *cis*:

Leaflets from EtOH. M.p. 47°. Sol. EtOH, Et_2O, CS_2. n_D^{15} 1·5043. S or I ⟶ β-form. Adds Br_2 ⟶ β-tetrabromide. Esters rearrange to β-esters.

β- or *trans*:

Leaflets from EtOH. M.p. 67° (72°). Sol. hot EtOH, H_2O. Insol. Et_2O.

Me ester: $C_{19}H_{32}O_2$. MW, 292. B.p. 209–224°/10 mm. D^{12} 0·900. n_D^{12} 1·482.

Et ester: $C_{20}H_{34}O_2$. MW, 306. B.p. 232°/14 mm. n_D^{20} 1·502.

Bromide: m.p. 115°.

Böeseken, Hoogland, Smit, Broek, *Rec. trav. chim.*, 1927, **46**, 619.
Böeseken, Ravenswaay, *Rec. trav. chim.*, 1925, **44**, 241.
Kametaka, *J. Chem. Soc.*, 1903, **83**, 1045.

Elaidic Acid (Trans *isomer of oleic acid*)

$CH_3·[CH_2]_7·CH:CH·[CH_2]_7·COOH$

$C_{18}H_{34}O_2$ MW, 282

Plates from EtOH. M.p. 44–5°. Sol. EtOH, Et_2O. B.p. 234°/15 mm. $D^{79·4}$ 0·8505. n_D^{100} 1·4308. SO_2 or S ⟶ oleic acid. HI + P ⟶ stearic acid.

Me ester: $C_{19}H_{36}O_2$. MW, 296. B.p. 213–15°/15 mm. D^{25} 0·8702. n_D^{25} 1·446.

Et ester: $C_{20}H_{38}O_2$. MW, 310. B.p. 217–19°/15 mm. D^{25} 0·8664. n_D^{25} 1·445.

Chloride: $C_{18}H_{33}OCl$. MW, 300·5. B.p. 216°/13 mm.

Anhydride: $C_{36}H_{66}O_3$. MW, 546. M.p. 51°.

Amide: $C_{18}H_{35}ON$. MW, 281. M.p. 93–4°.

Nitrile: $C_{18}H_{33}N$. MW, 263. M.p. −1°. B.p. 213°/16 mm.

Dibromide: m.p. 29–30°.

Nitrosochloride: m.p. 99–100°.

Harries, Thieme, *Ann.*, 1905, **343**, 354.
Rankoff, *Ber.*, 1931, **64**, 619.
Phillipi, *Monatsh.*, 1929, **51**, 277 (*Bibl.*).

Elaidic Alcohol.
See Octadecenyl Alcohol.

Elaidyl Alcohol.
See Octadecenyl Alcohol.

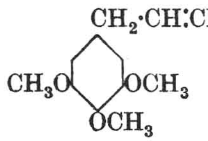
α-Elaterin.
Constituent of fruit of *Ecballium elaterium*. Prisms from EtOH. M.p. 223° (230°). Sol. EtOH, Et_2O, C_6H_6, $CHCl_3$. Insol. H_2O. $[\alpha]_D^{25}$ $-52{\cdot}9°$. Dark red sol. in conc. H_2SO_4. Physiologically inactive.

Power, Moore, *Pharm. J.*, 1919, [4], **29**, 501; *J. Chem. Soc.*, 1909, **95**, 1989.

β-Elaterin.
Constituent of fruit of *Ecballium elaterium*. Needles from EtOH. M.p. 190–5°. $[\alpha]_D^{25}$ $+13{\cdot}9°$. More sol. EtOH than α-elaterin. Physiologically active.

See above references.

Elemicin (3 : 4 : 5-*Trimethoxy*-1-*allylbenzene*)

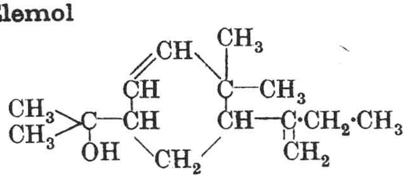


$C_{12}H_{16}O_3$ MW, 208

Constituent of Elemi oil. B.p. 144–7°/10 mm. D^{20} 1·063. n_D^{20} 1·5288. Ozone ⟶ trimethoxyphenylacetic acid. NaOH ⟶ isoelemicin (3:4:5-trimethoxy-1-propenylbenzene), b.p. 153–6°/10 mm., D^{20} 1·077, n_D^{20} 1·547.

Semmler, *Ber.*, 1908, **41**, 1918, 2556.
Mauthner, *Ann.*, 1917, **414**, 252.
Smith, *Proceedings of the Royal Society of Victoria*, 1919, **32**, 14.

α-Elemol



$C_{15}H_{26}O$ MW, 222

Constituent of Manila elemi oil. M.p. 47°. B.p. 142–3°/12 mm. D_4^{18} 0·9345. n_D^{18} 1·4980. Warm H·COOH ⟶ elemene. Se ⟶ eudalene.
Benzoyl: b.p. 160–4°/0·25 mm.
Phenylurethane: m.p. 112°.
Dihydro deriv.: m.p. 47°. B.p. 138°/12 mm. D_4^{15} 0·934. n_D^{15} 1·4925.

Ruzicka, Pfeiffer, *Helv. Chim. Acta*, 1926, **9**, 841.
Ruzicka, van Veen, *Ann.*, 1929, **476**, 70.

α-Elemolic Acid (*α-Elemic acid*)

$C_{30}H_{48}O_3$ MW, 456

Cryst. from Me_2CO.Aq. M.p. 215°. $[\alpha]_D$ $-24{\cdot}48°$. Ox. ⟶ elemonic acids.
Me ester: $C_{31}H_{50}O_3$. MW, 470. M.p. 144–5°. B.p. 252–3°/0·2 mm.
Et ester: $C_{32}H_{52}O_3$. MW, 484. M.p. 132·5–133·5°. B.p. 263–5°/0·3 mm. D^{141} 0·9685. n_D^{141} 1·4836.
Acetate: m.p. 225°. $[\alpha]_D^{20}$ $-40°$.
Dibromide: m.p. 207°. $[\alpha]_D^{20}$ $-17{\cdot}14°$.
Dihydro deriv.: m.p. 238° (246–7°).

Ruzicka *et al.*, *Helv. Chim. Acta*, 1932, **15**, 681.
Mladenović, Lieb, *Monatsh.*, 1931, **58**, 69.

γ-Elemolic Acid

$C_{30}H_{50}O_3$ MW, 458

Cryst. from EtOH. M.p. 281°. $[\alpha]_D^{20}$ $+68{\cdot}76°$.
Acetate: m.p. 180°.

See above references.

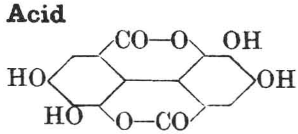
δ-Elemolic Acid

$C_{30}H_{46}O_3$ MW, 454

M.p. 217–19°.
Me ester: $C_{31}H_{48}O_3$. MW, 468. M.p. 112–13°. D^{118} 0·9958. n_D^{114} 1·4949.

Ruzicka *et al.*, *Helv. Chim. Acta*, 1932, **15**, 681.

Ellagic Acid

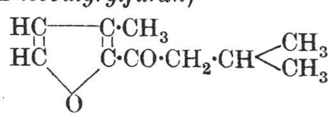


$C_{14}H_6O_8$ MW, 302

Occurs free and combined in galls. Needles + 2Py from Py. M.p. above 360°. Spar. sol. H_2O, EtOH. Insol. Et_2O. Sol. alkalis ⟶ yellow sols. $FeCl_3$ ⟶ green col. KOH fusion ⟶ hexahydroxydiphenyl. Zn dist. ⟶ fluorene.
Tetra-acetyl: m.p. 343–6° (317–19°).
Tetracarbethoxyl: m.p. 244°.

Perkin, Nierenstein, *J. Chem. Soc.*, 1905, **87**, 1415.
Nierenstein, *Helv. Chim. Acta*, 1931, **14**, 912.
Zetzsche, Graef, *ibid.*, 240.

Elsholtzione (*Isobutyl 3-methylfuryl ketone*, 3-*methyl*-2-*isobutyrylfuran*)

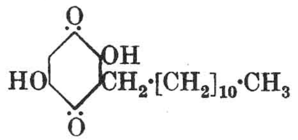


$C_{10}H_{14}O_2$ MW, 166

Constituent of *Elsholtzia cristata*. B.p. 210°, 91–4°/12 mm. D^{20} 0·9817. n_D^{21} 1·4842.
Oxime: m.p. 54°.
Semicarbazone: m.p. 171–2°.

Reichstein, Zschokke, Goerg, *Helv. Chim. Acta*, 1931, **14**, 1277.
Asahina, Murayama, *Arch. Pharm.*, 1914, **252**, 435.

Embelin (*Embelic acid*, 2 : 5-*dihydroxy*-3-n-*dodecyl*-p-*benzoquinone*)

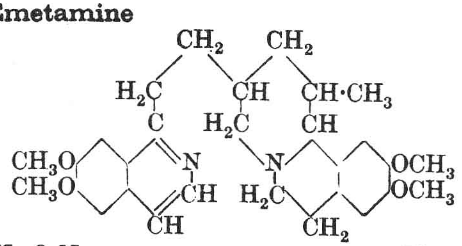


$C_{18}H_{28}O_4$ MW, 308

Constituent of *Embelia ribes*. Orange red plates from Et_2O–C_6H_6. M.p. 143° (with sublimation). Insol. H_2O. Reddish-violet sols. in alkalis. Gives coloured pptes. with many inorganic salts. Combines with primary amines. KOH.Aq. ⟶ 1-ketomyristic acid. Tautomerises. Anthelmintic.
Diacetyl: m.p. 54°.
Dibenzoyl: m.p. 97–8°.
Tetra-oxime: m.p. 175°.
Di-semicarbazone: m.p. 236°.
Di-phenylhydrazone: m.p. 189–90°.
Benzylidene deriv.: m.p. 112°.
Di-benzylidene deriv.: m.p. 142°.
Di-methylamine deriv.: m.p. 216°.
Di-aniline deriv.: m.p. 167–8°.

Hefter, Feuerstein, *Arch. Pharm.*, 1900, **238**, 15.
Hasan, Stedman, *J. Chem. Soc.*, 1931, 2112.
Kaul, Ray, Dutt, *J. Indian Chem. Soc.*, 1929, **6**, 577.

Emetamine



$C_{29}H_{36}O_4N_2$ MW, 476

From roots of *Pyschotria ipecacuanha*. Needles from AcOEt. M.p. 153–4°. Sol. EtOH, C_6H_6, $CHCl_3$. Spar. sol. Et_2O. Insol. H_2O, alkalis. Sol. conc. H_2SO_4. $[\alpha]_D^{20}$ +13·6.
B,2HCl: m.p. anhyd. 218–23°. $[\alpha]_D$ −17·5°.
B,2HBr: m.p. 210–25°. $[\alpha]_D$ −24·3°.
B,2HNO₃: m.p. 165–6°.
$B,2H_2C_2O_4$: m.p. 172°. $[\alpha]_D$ −6°.
Picrate: m.p. 173°.

Brindley, Pyman, *J. Chem. Soc.*, 1927, 1071.

Emetine (*Cephæline methyl ether*. See formula under Cephæline)

$C_{29}H_{40}O_4N_2$ MW, 480

Principal alkaloid from roots of *Psychotria ipecacuanha*. Amorphous powder. M.p. 74°. Sol. EtOH, Et_2O, $CHCl_3$. Spar. sol. C_6H_6. Insol. H_2O. $[\alpha]_D^{15}$ −32·7°. Sensitive to light.
B,2HCl: m.p. 235–55°. $[\alpha]_D$ +21°.
B,2HBr: m.p. 250–65°. $[\alpha]_D$ +15·2°.
$B,2HNO_3$: m.p. 245°.
B,H_2SO_4: m.p. 205–45°.

Staüb, *Helv. Chim. Acta*, 1927, **10**, 826.
Carr, Pyman, *J. Chem. Soc.*, 1914, **105**, 1591.
Späth, Liethe, *Ber.*, 1927, **60**, 688.

Emodin.
See Aloe-emodin, Frangula-emodin, *and* Natalol-emodin.

Enneamethylene.
See Cyclononane.

Ephedrine (2-*Methylamino*-1-*phenylpropanol*-1, α-*hydroxy*-β-*methylaminopropylbenzene*)

$$C_6H_5\cdot CH(OH)\cdot CH(NH\cdot CH_3)\cdot CH_3$$

$C_{10}H_{15}ON$ MW, 165

l-.
Present in various species of *Ephedra*. Hydrated cryst. from H_2O. M.p. 40°. B.p. 225°. Sol. H_2O, EtOH, Et_2O, $CHCl_3$. $[\alpha]_D^{20}$ −6·3° in EtOH.
B,HCl: m.p. 218°. $[\alpha]_D^{20}$ −36·6° (−34·9°) in H_2O.
B,HBr: m.p. 205°.
B,H_2PtCl_6: needles. M.p. 186°.
$B,HAuCl_4$: yellow needles. M.p. 128–31°.
N-p-*Nitrobenzoyl*: pale yellow prisms. M.p. 187–8°. $[\alpha]_D^{20}$ −51·77° in $CHCl_3$.

d-.
Plates from H_2O. M.p. 40–40·5°.
B,HCl: plates from EtOH. M.p. 217–18°. $[\alpha]_D^{20}$ +34·42° in H_2O. More easily sol. than *l*-form.
N-p-*Nitrobenzoyl*: yellowish leaflets from EtOH. M.p. 187–8°. $[\alpha]_D^{20}$ +51·12° in $CHCl_3$.

dl-.
Needles from Et_2O or pet. ether. M.p. 76°. Sol. H_2O, EtOH, Et_2O, $CHCl_3$, C_6H_6.

B,HCl: plates from EtOH. M.p. 188–189·5°

B,HAuCl₄: yellow cryst. M.p. 115°.

B_2,H_2PtCl_6: reddish-yellow needles or leaflets. M.p. 199° (183°) decomp.

N-p-*Nitrobenzoyl*: pale yellow plates from EtOH. M.p. 162°.

Methiodide: needles. M.p. 228–9°.

Nagai, Kanao, *Ann.*, 1929, **470**, 157.
Emde, *Helv. Chim. Acta*, 1929, **12**, 365, 405.
Späth, Göhring, *Monatsh.*, 1920, **41**, 319.
Freudenburg, Braun, Schoeffel, *J. Am. Chem. Soc.*, 1932, **54**, 234.
Hoffmann–La Roche A.G., D.R.P., 554,553, (*Chem. Zentr.*, 1932, II, 1693).

ψ-Ephedrine (*Isoephedrine*)

$C_6H_5 \cdot CH(OH) \cdot CH(NH \cdot CH_3) \cdot CH_3$

$C_{10}H_{15}ON$ MW, 165

l-.

Prisms from Et_2O. M.p. 118–118·5°. $[\alpha]_D^{20}$ −51·93° in EtOH.

B,HCl: needles from EtOH. M.p. 182–182·5°. $[\alpha]_D^{20}$ −61·88°.

d-.

Occurs in leaves of *Ephedra vulgaris*. Prisms from Et_2O. M.p. 117–18°. $[\alpha]_D^{20}$ +51·24° in EtOH. Sol. EtOH, Et_2O. Spar. sol. cold H_2O.

B,HCl: prisms from EtOH. M.p. 182–182·5°. $[\alpha]_D^{20}$ +61·6° in H_2O.

Oxalate: needles from EtOH. M.p. 219°.

N-p-*Nitrobenzoyl*: yellowish cryst. from EtOH. M.p. 177°. $[\alpha]_D^{20}$ +140·8° in $CHCl_3$.

$B,HAuCl_4$: m.p. 126–126·5°.

dl-.

Needles. M.p. 118°. Sol. EtOH, C_6H_6. Spar. sol. H_2O, Et_2O.

B,HCl: needles from EtOH. M.p. 164°.

Oxalate: prisms from EtOH. M.p. 218° decomp.

$B,HAuCl_4$: yellow prisms. M.p. 117°.

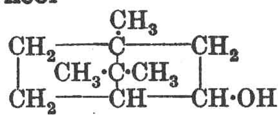
$(B,HCl)_2,AuCl_3$: yellow needles. M.p. 194°.

N-p-*Nitrobenzoyl*: prisms from EtOH. M.p. 165–6°.

Methiodide: cryst. from H_2O. M.p. 183°.

Späth, Koller, *Ber.*, 1925, **58**, 1268.
Nagai, Kanao, *Ann.*, 1929, **470**, 157.
Emde, *Helv. Chim. Acta*, 1929, **12**, 365.
Bossert, Brode, *J. Am. Chem. Soc.*, 1934, **56**, 165.

l-Epiborneol



$C_{10}H_{18}O$ MW, 154

Cryst. from pet. ether. M.p. 181–182·5°. Ox. ⟶ *l*-epicamphor.

Acetyl: b.p. 114°/19 mm., $[\alpha]_D^{16}$ +15·63°. D_4^{14} 0·988.

Phenylurethane: needles from pet. ether. M.p. 82°.

Dinitrobenzoate: m.p. 103°. $[\alpha]_D^{15}$ +28·37.

Bredt, Pinten, *J. prakt. Chem.*, 1927, **115**, 52.
Bredt, Perkin, *J. Chem. Soc.*, 1913, **103**, 2222.
Bredt-Savelsberg, Bund, *J. prakt. Chem.*, 1931, **131**, 48.

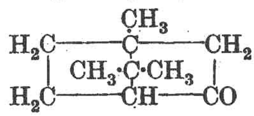
α-Epibromohydrin (3-*Bromopropylene oxide*)

C_3H_5OBr MW, 137

B.p. 134–6°, 61–2°/50 mm.

Braun, *J. Am. Chem. Soc.*, 1932, **54**, 1250.

Epicamphor (β-*Camphor*)



$C_{10}H_{16}O$ MW, 152

l-.

M.p. 183·5–184° (corr.). B.p. 213°. $[\alpha]_D^{18}$ −58·21° in C_6H_6. Very sol. EtOH, Et_2O. Spar. sol. H_2O. Na + EtOH ⟶ *l*-epiborneol. Ox. ⟶ *d*-camphoric acid. Odour similar to that of *d*-camphor.

Oxime: needles from MeOH. M.p. 103–4°. $[\alpha]_D$ +100·5°.

Semicarbazone: needles from EtOH. M.p. 237–8° decomp.

Isonitroso deriv.: exists in two forms. M.p.'s 168–70° and 138–40°.

d-.

M.p. 182°. $[\alpha]_D$ +58·4° in C_6H_6.

Oxime: needles from MeOH. M.p. 103°. $[\alpha]_D$ −98·9°.

Semicarbazone: needles. M.p. 237–8°.

dl-.

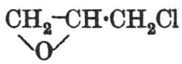
Cryst. from pet. ether. M.p. 180°.

Oxime: needles from MeOH. M.p. 98–100°.

Bredt, Perkin, *J. Chem. Soc.*, 1913, **103**, 2182.
Furness, Perkin, *J. Chem. Soc.*, 1914, **105**, 2026.
Bredt, Bredt-Savelsberg, *Ber.*, 1929, **62**, 2216.
Bredt, Drouven, Schumann, Scholl, *J. prakt. Chem.*, 1931, **131**, 132.
Asahina, Ishidate, Momose, *Ber.*, 1934, **67**, 1432.

Epicatechin.
See under Catechin.

α-Epichlorohydrin (3-*Chloropropylene oxide*)



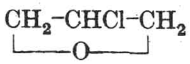
C_3H_5OCl MW, 92·5

B.p. 115–17°, 60–61°/100 mm. D_4^{20} 1·181. n_D^{20} 1·438. Insol. H_2O. Hot AcOH ⟶ acetochlorohydrin. Ac_2O ⟶ diacetochlorohydrin. Na or Na.Hg ⟶ allyl alcohol. HI ⟶ *n*-propyl chloride. EtOH + H_2SO_4 ⟶ 1-chlorohydrin 3-Et ether.

Polyepichlorohydrin: needles from EtOH. M.p. 109–10°.

Clarke, Hartman, *Organic Syntheses*. Collective Vol. I, 228.
Fairbourne, Gibson, Stephens, *J. Chem. Soc.*, 1932, 1968.
Braun, *J. Am. Chem. Soc.*, 1932, **54**, 1248.

β-Epichlorohydrin (2-*Chlorotrimethylene oxide*)

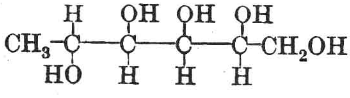


C_3H_5OCl MW, 92·5

B.p. 132–4°. More stable than the α-compound. Does not react with very dil. acids. PCl_5 ⟶ CH_2:CCl·CH_2Cl. Na or Na.Hg ⟶ allyl alcohol.

Bigot, *Ann. chim. phys.*, 1891, **22**, 468.

Epifucitol



$C_6H_{14}O_5$ MW, 166

d-.

Cryst. from H_2O. M.p. 104°. $[\alpha]_D^{21}$ +2° in H_2O.

Di-benzylidene deriv.: needles from EtOH. M.p. 184°

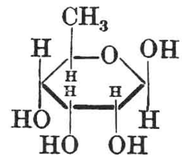
l-.

Cryst. from H_2O. M.p. 104°. $[\alpha]_D$ −2·3° in H_2O.

Di-benzylidene deriv.: cryst. from EtOH. M.p. 183°. $[\alpha]_D$ +39·7° in $CHCl_3$.

Votoček, Valentin, *Chem. Zentr.*, 1930, I, 2544.
Votoček, Kučerenko, *ibid.*

Epifucose



Probable structure

$C_6H_{12}O_5$ MW, 164

d-. (Epirhodeose).

Dextrorotatory syrup. HNO_3 ⟶ trihydroxyriboglutaric acid. NaHg (acid) ⟶ epi-*d*-fucitol. Epimeric with *d*-fucose (rhodeose).

Phenylosazone: m.p. 170°. Decomp. at 177–80°.

Methylphenylhydrazone: m.p. 136°.

l-.

Yellow lævorotatory syrup. 12% HCl ⟶ methylfurfural. NaHg (acid) ⟶ epi-*l*-fucitol. Gives deep red col. with 1-naphthol in EtOH + conc. H_2SO_4. Epimeric with *l*-fucose.

Phenylosazone: m.p. 177–8° decomp.

p-*Bromophenylosazone*: m.p. 204°.

Methylphenylhydrazone: m.p. 137°.

Votoček, Krauz, *Ber.*, 1911, **44**, 362.
Votoček, Valentin, *Chem Zentr.*, 1930, I, 2544.
Votoček, Červený, *Ber.*, 1915, **48**, 658; *Chem. Zentr.*, 1928, I, 267.
Votoček, Kučerenko, *Chem. Zentr.*, 1930, I, 2544.

Epiglucosamine.
See under Glucosamine.

Epiglucosaminic Acid.
See under Glucosaminic Acid.

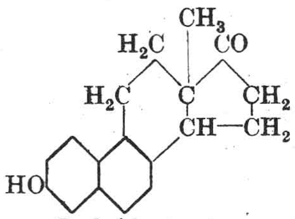
Epihydrin Alcohol.
See Glycide.

Epinephrine.
See l-Adrenaline.

Epirhodeose.
See Epifucose.

ε-Acid (*Epsilon acid*).
See 1-Naphthol-3 : 8-disulphonic Acid.

Equilenine



Probable structure

$C_{18}H_{18}O_2$ MW, 266

Occurs in urine of pregnant mares. Needles from MeOH. M.p. 258–9° decomp. Spar. sol. EtOH. $[\alpha]_D^{16}$ +87°.

Acetyl : m.p. 156–7°.

Benzoyl : needles from EtOH. M.p. 222–3°.

Monobromide : needles from propyl alcohol. M.p. 225–7° decomp.

Oxime : needles from EtOH. M.p. 249–50°.

Semicarbazone : needles. M.p. 268°.

Picrate : orange prisms. M.p. 205–8°.

Girard *et al.*, *Compt. rend.*, 1932, **195**, 981; *Bull. soc. chim. biol.*, 1933, **15**, 562.
Sandulesco, Tchung, Girard, *Compt. rend.*, 1933, **196**, 137.

Equiline

$C_{18}H_{20}O_2$ (?) MW, 268

M.p. 238–40°. Sublimes in vacuo at 170–200°. $[\alpha]_D^{15}$ +308° in dioxan (1% sol.).

Semicarbazone : needles from Py. M.p. 265–7°.

Oxime : needles from EtOH.Aq. M.p. 221–3°.

Benzoyl : plates from EtOH. M.p. 197–8°.

Girard *et al.*, *Compt. rend.*, 1932, **194**, 1020.

Equol

$C_{15}H_{14}O_3$ MW, 242

Inactive phenol isolated from mare's urine. Cryst. from EtOH.Aq. M.p. 189–190·5°. $[\alpha]_{5461}$ −21·5°.

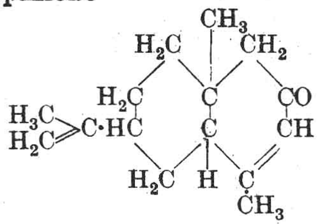
Di-Me ether : $C_{17}H_{18}O_3$. MW, 270. Cryst. from MeOH. M.p. 89°.

Diacetyl : cryst. from MeOH. M.p. 122·5°.

Dibenzoyl : cryst. from MeOH–$CHCl_3$. M.p. 187–9°. Forms liquid crystals.

Marrian, Haslewood, *Biochem. J.*, 1932, **26**, 1227.

Eremophilone



$C_{15}H_{22}O$ MW, 218

Constituent of oil from wood of *Eremophila Mitchelli*. Needles from MeOH. M.p. 41–2°. B.p. 171°/15 mm. D^{25} 0·9994. n_D^{25} 1·5182. $[\alpha]_{5461}$ −207° in MeOH. Does not reduce Fehling's nor give col. with $FeCl_3$. $H_2O_2 \longrightarrow$ eremophilone oxide, m.p. 63–4°. Na + EtOH $\longrightarrow$ dihydroeremophilol, b.p. 168–70°/14 mm.

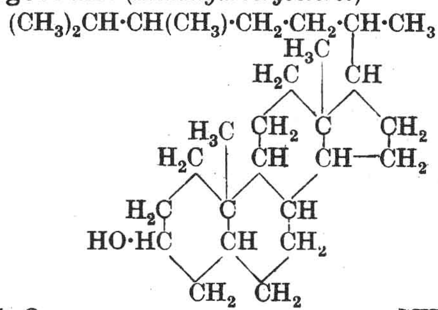
Semicarbazone : m.p. 202–3°. $[\alpha]_{5461}$ −293° in MeOH.

Hydroxymethylene deriv. : prisms from MeOH. M.p. 105°.

Bradfield, Penfold, Simonsen, *J. Chem. Soc.*, 1932, 2744.

Ergamine (**Histamine**).
4-[ω-Aminoethyl]-glyoxaline, *q.v.*

Ergostanol (*Hexahydroergosterol*)



$C_{28}H_{50}O$ MW, 402

Needles from MeOH–Et_2O. M.p. 144–5°. $[\alpha]_D$ +15·94° in $CHCl_3$.

Acetyl : needles from MeOH–Et_2O. M.p. 144–5°. $[\alpha]_D$ +5·95° in $CHCl_3$.

Chloroacetyl : m.p. 200–1°.

Benzoyl : m.p. 163–5°.

p-*Toluenesulphonyl* : m.p. 150–1°.

Reindel, *Ann.*, 1928, **466**, 141.
Heilbron, Sexton, *J. Chem. Soc.*, 1929, 921.

Ergostenol (*Tetrahydroergosterol*)

$C_{28}H_{48}O$ MW, 400

α-.

Leaves from MeOH. M.p. 130–1°. $[\alpha]_D$ +17·86° in $CHCl_3$.

Acetyl : leaves from EtOH. M.p. 110°. $[\alpha]_D$ $+5{\cdot}18°$ in $CHCl_3$.

Benzoyl : needles from MeOH–Et_2O. M.p. 118°.

p-*Toluenesulphonyl* : m.p. 162–3° decomp.

β-.

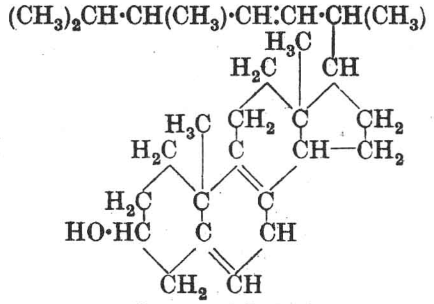
Plates from EtOH. M.p. 141–2°. $[\alpha]_D^{20}$ $+19{\cdot}4°$ in $CHCl_3$.

Acetyl : plates from EtOH. M.p. 111–12°. $[\alpha]_D^{20}$ $+13{\cdot}1°$ in $CHCl_3$.

Benzoyl : prisms from C_6H_6–EtOH. M.p. 158–60°. $[\alpha]_D^{20}$ $+18{\cdot}3°$.

Reindel, Walter, *Ann.*, 1928, **460**, 212.
Heilbron, Wilkinson, *J. Chem. Soc.*, 1932, 1708.
See also last reference above.

Ergosterol



Suggested formula

$C_{28}H_{44}O$ MW, 396

Occurs in yeast. Cryst. with H_2O of cryst. from EtOH, anhyd. from Et_2O. M.p. 163°. $[\alpha]_D$ $-133°$ in $CHCl_3$. Sol. $CHCl_3$, C_6H_6. Spar. sol. EtOH, Et_2O, AcOH, pet. ether. Ultraviolet irradiation ⟶ mixture of compounds including Vitamin D. $SbCl_3$ in $CHCl_3$ ⟶ violet col. Forms an insol. digitonide.

Me ether : $C_{29}H_{46}O$. MW, 410. Cryst. from AcOEt–EtOH. M.p. 151–2°.

Acetyl : plates from Et_2O–EtOH. M.p. 175–6°.

Benzoyl : cryst. from EtOH. M.p. 168°. $[\alpha]_D$ $-68°$.

Palmityl : leaflets from AcOEt. M.p. 107–8°.

Phenylurethane : prisms from EtOH. M.p. 185°.

Tanret, *Compt. rend.*, 1908, **147**, 75.
Windaus, Inhoffen, Reichel, *Ann.*, 1934, **510**, 248.
Dunn, Heilbron, Phipers, Samant, Spring, *J. Chem. Soc.*, 1934, 1576.

Ergotamine

$C_{33}H_{35}O_5N_5$ MW, 581

Constituent of Ergot alkaloids. Rectangular plates from Me_2CO.Aq. M.p. 213–14° decomp. Easily sol. Py, $PhNO_2$. Sol. Et_2O, $CHCl_3$, C_6H_6. Insol. pet. ether. Sol. NaOH.Aq. Insol. Na_2CO_3. $[\alpha]_{5461}^{20}$ $-181°$. $[\alpha]_{5790}^{20}$ $-159°$ in $CHCl_3$. Boiling MeOH ⟶ ergotaminine. Alc. KOH ⟶ ergine.

Smith, Timmis, *J. Chem. Soc.*, 1930, 1390; 1932, 1543.
Soltys, *Ber.*, 1932, **65**, 553.

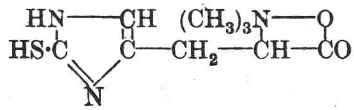
Ergotaminine

$C_{33}H_{35}O_5N_5$ MW, 581

Constituent of Ergot alkaloids. Plates from EtOH. M.p. 252° decomp. $[\alpha]_{5461}^{18}$ $+450°$, $[\alpha]_{5790}^{18}$ $+385°$ in $CHCl_3$. Easily sol. Py. Sol. $CHCl_3$, $PhNO_2$. Spar. sol. MeOH, EtOH, Me_2CO, AcOEt, C_6H_6. Insol. pet. ether. Insol. dil. alkalis or alkali carbonates. Formed when ergotamine is boiled with MeOH. Alc. KOH ⟶ ergine.

See above references.

Ergothioneine (*Thioneine, thiasine*)



$C_9H_{15}O_2N_3S$ MW, 229

Plates + $2H_2O$. M.p. 290° decomp. $[\alpha]_D$ $+116{\cdot}5°$. Gives ppt. with Meyer's reagent and $HgCl_2$, but not with picric or tannic acids. $FeCl_3$ ⟶ trimethylhistidine.

Akabori, *Ber.*, 1933, **66**, 151.
Barger, Ewins, *J. Chem. Soc.*, 1911, **99**, 2336.
Tanret, *Compt. rend.*, 1909, **149**, 222.

Ergotinine

$C_{35}H_{39}O_5N_5$ MW, 609

Occurs in *Claviceps purpurea*, parasitic on cereals. Prisms from Me_2CO.Aq. M.p. 239° decomp., sinters at 210°. $[\alpha]_{5461}$ $+459°$ in $CHCl_3$. Slightly sol. H_2O. Mod. sol. hot EtOH, C_6H_6. Alc. KOH ⟶ ergine. Blue-violet fluor. in acid sols. Sol. in H_2SO_4 + $FeCl_3$ ⟶ orange col. changing to blue. Hyd. (EtOH + H_3PO_4) ⟶ ergotoxine.

Barger, Carr, *J. Chem. Soc.*, 1907, **91**, 337.
Barger, Ewins, *J. Chem. Soc.*, 1918, **113**, 235.
Soltys, *Ber.*, 1932, **65**, 553.
Smith, Timmis, *J. Chem. Soc.*, 1931, 1888.
Jacobs, Craig, *J. Biol. Chem.*, 1935, **110**, 521.

Ergotoxine

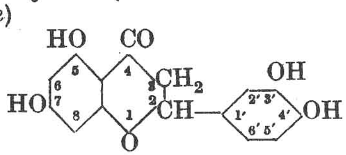
$C_{35}H_{41}O_6N_5$ MW, 627

Prisms + $\frac{1}{2}C_6H_6$ from C_6H_6. Loses C_6H_6 and melts at 190–200°. $[\alpha]^{18}_{5461}$ −226° in $CHCl_3$. Sol. EtOH, MeOH, Et_2O, boiling C_6H_6, caustic alkalis. Insol. H_2O. Hot MeOH ⟶ ergotinine. Alc. KOH ⟶ ergine. Pptd. by alkaloid reagents.

B,HCl: plates. M.p. 205°.
$B_2,H_2C_2O_4$: plates. M.p. 179° decomp.
B,H_3PO_4,H_2O: needles. M.p. 186–7° decomp.
$B,C_2H_5SO_3H,2C_2H_5OH$: m.p. 209°.

Smith, Timmis, *J. Chem. Soc.*, 1930, 1390.
Barger, Ergot and Ergotism, 1931. (Textbook.)
See also previous references.

Eriodictyol (5 : 7 : 3′ : 4′-*Tetrahydroxyflavanone*)



$C_{15}H_{12}O_6$ MW, 288

Occurs in leaves of *Eriodictyon californicum* Dcne, and *Eriodictyon glutinosum* Benth. Plates from EtOH. M.p. 267°. Mod. sol. hot EtOH, AcOH. Spar. sol. boiling H_2O. Sol. alkalis and alkali carbonates.

Acetyl deriv.: m.p. 137°.
3′-*Me ether*: *see* Homoeriodictyol.
7 : 3′ : 4′-*Tri-Me ether*: $C_{18}H_{18}O_6$. MW, 330. Needles. M.p. 136°.

Shinoda, Sato, *Chem. Abstracts*, 1929, **23**, 4210.
Tutin, *J. Chem. Soc.*, 1910, **97**, 2054.
Power, Tutin, *J. Chem. Soc.*, 1907, **91**, 895.

Eriodictyonone.
See Homoeriodictyol.

Erucic Acid (*cis*-Δ^{12}-*Docosenoic acid*. Cf. Brassidic Acid)

$CH_3\cdot[CH_2]_7\cdot CH{:}CH\cdot[CH_2]_{11}\cdot COOH$

$C_{22}H_{42}O_2$ MW, 338

Present as glyceride in rape and many other vegetable oils. Cryst. from MeOH. M.p. 33·5–34°. B.p. 241–3°/5 mm. Nitrogen oxides ⟶ brassidic acid.

Me ester: $C_{23}H_{44}O_2$. MW, 352. B.p. 221–2°/5 mm.
Et ester: $C_{24}H_{46}O_2$. MW, 366. B.p. 229–30°/5 mm.
Amide: $C_{22}H_{43}ON$. MW, 337. M.p. 65–6°.
Anhydride: $C_{44}H_{82}O_3$. MW, 658. M.p. 47·5–48°.
Anilide: m.p. 65–6°.

Noller, Talbot, *Organic Syntheses*, 1930, X, 44.
Holde, Zadek, *Ber.*, 1923, **56**, 2052.

Erucyl Alcohol (*Docosenol, docosenyl alcohol, 1-hydroxydocosene*)

$CH_3\cdot[CH_2]_7\cdot CH{:}CH\cdot[CH_2]_{11}\cdot CH_2OH$

$C_{22}H_{44}O$ MW, 324

Cryst. from Me_2CO or MeOH. M.p. 34·5–35·5°. B.p. 240·5–241·5°/10 mm., 199°/0·2 mm. Sol. EtOH, AcOH, C_6H_6, pet. ether. Red. ⟶ docosyl alcohol.

Dibromide: m.p. 45°.
Phenylurethane: m.p. 86–86·5°.

Willstätter, Mayer, Hüni, *Ann.*, 1911, **378**, 101.
Levene, West, van der Scheer, *J. Biol. Chem.*, 1915, **20**, 527.
Bleyberg, Ulrich, *Ber.*, 1931, **64**, 2504.

Erythrene (1 : 3-*Butadiene, divinyl*)

$CH_2{:}CH\cdot CH{:}CH_2$

C_4H_6 MW, 54

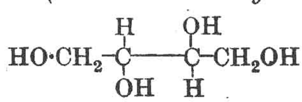
Gas. B.p. −2·6°. Heated 10 days at 110–20° ⟶ butadiene caoutchouc (synthetic rubber, artificial rubber). Br in $CHCl_3$ ⟶ 1 : 4-dibromobutylene-2. Excess Br ⟶ 1 : 2 : 3 : 4-tetrabromobutane.

Tetrachloro deriv.: prisms. M.p. 72–3°. B.p. 130–40°/50 mm.

Thiele, *Ann.*, 1899, **308**, 337.
Harries, *Ann.*, 1911, **383**, 179.
Leyes, E.P., 329,748, (*Chem. Zentr.*, 1930, II, 133).
Ostromysslenski, Kjelbasinski, *Chem. Zentr.*, 1916, I, 875.
I.G., E.P., 307,945, (*Chem. Zentr.*, 1929, II, 217).
I.G., E.P., 291,748, (*Chem. Zentr.*, 1930, I, 1049).
I.G., E.P., 315,595, *ibid.*, 2161.

Erythrene-1 : 4-dicarboxylic Acid.
See Muconic Acid.

Erythritol (1 : 2 : 3 : 4-*Tetrahydroxybutane*)



$C_4H_{10}O_4$ MW, 122