

Терпены

Технические характеристики

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Калининград (4012)72-03-81
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Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
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Ростов-на-Дону (863)308-18-15
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Тверь (4822)63-31-35
Тольятти (8482)63-91-07
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Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
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Terpenes

Terpenes are a large family of natural products and are known to be the primary constituents of essential oils. They are biosynthesized via the mevalonate pathway. The basic structure is derived from five-carbon isoprene units^{1,2)} which are linked together in a head-to-tail fashion to form linear chains or rings. They can be classified on the basis of the length of the carbon chains as illustrated below.

Table 1. Classification of Terpenes and Examples

Name	Number of Carbons	Examples
Hemiterpenes	5	Isoprene
Monoterpenes	10	Menthol, Geraniol: Flavors, Food Additives
Sesquiterpenes	15	Artemisinin: Antimalarial Drug α -Bisabolol: Flavor, Cosmetic Ingredients
Diterpenes	20	Paclitaxel: Antitumor Agent, Gibberellins: Plant Hormones
Triterpenes	30	Lanosterol: Precursor of Steroid Biosynthesis

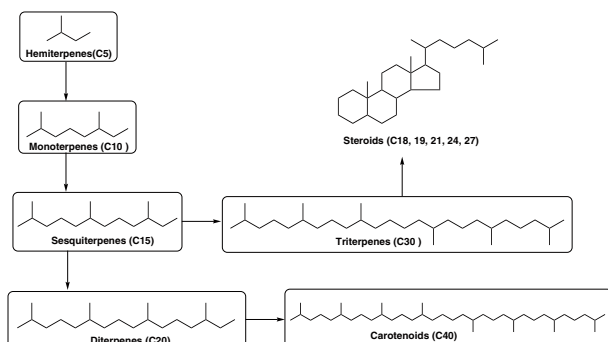


Figure 1. Biosynthetic Pathway of Terpene Skeletons

Terpenes are widespread in nature existing in marine organisms as well as in plants. Some terpenes show characteristic bioactivity such as antitumor activities, and their modes of action is currently under investigation. Since terpenes are mainly found in plants, they are frequently used as markers in plant metabolome analyses.

Nomenclature

According to the IUPAC Nomenclature Appendix, 42 parent skeletons are shown.³⁾ Practically, other common names are also used frequently. For further trivial names, please refer to References.^{2,4)}

Solubility

In general, most of the terpenes are insoluble in water but soluble in ethanol, chloroform and diethyl ether. They can be added to the buffer solution as a dimethyl sulfoxide solution to examine their activity in living organisms. Please take caution that the solution becomes suspended as the concentration level of the dissolved substance increases. It is recommended to define the optimal concentration level and volume of addition in advance. Glycosides of terpenes are more water-soluble than their aglycones.

Stability

In general, monoterpenes are relatively stable. However, oily sesquiterpenes and diterpenes are less stable bearing more oxygen functional groups rendering them unsuitable for storage over longer periods. However, most of the triterpenes are solid and show good stability.

Detection

Since some terpenes do not have chromophore unit, UV detection by normal-phase HPLC is difficult. As a result, RI (refractive index) detector can be used instead. Normal-phase TLC is also frequently used to visualize terpenes by spraying them with phosphomolybdic acid solution or cerium sulfate solution followed by heating.

Some Tips

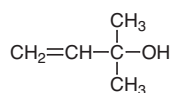
- Monoterpenes and some sesquiterpenes form azeotropic mixtures with the traces of water present in the sample, leading to a considerable loss during distillation. It is therefore recommended that these terpenes should be properly dried prior to their use using the following procedure:
 - (1) dissolution of the sample in an appropriate organic solvent
 - (2) drying it over anhydrous sodium or magnesium sulfate and
 - (3) removal of the solvent in vacuo.
- In NMR measurement, using two different solvents separately, deuteriochloroform (CDCl_3) and benzene- d_6 (C_6D_6), may change the signal patterns to facilitate interpretation of the spectrum (mainly for proton). In addition, some hidden signals might also appear owing to the variation in the residual water signal positions.
- During storage over longer periods, CDCl_3 might partially decompose to form phosgene which can damage your precious sample. Therefore care should be taken especially while using CDCl_3 with high deuterium ratio (no less than 99.95%D). The sample should not be stored in the NMR tube as a solution after its analysis but recovered from the tube and the solvent should be evaporated completely to prevent its decomposition.

References

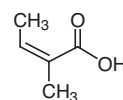
- P. M. Dewick, in *Medicinal Natural Products*, 3rd ed., John Wiley & Sons, Chichester, **2009**, p. 187.
- E. Breitmaier, in *Terpenes*, Wiley-VCH, Weinheim, **2006**.
- P. M. Gills Jr., *Pure Appl. Chem.* **1999**, 71, 587.
- a) For Sesquiterpenes: B. M. Fraga, *Nat. Prod. Rep.* **2008**, 25, 1180.
b) For Diterpenes: J. R. Hanson, *Nat. Prod. Rep.* **2007**, 24, 1332.
c) For Triterpenes: J. D. Connolly, R. A. Hill, *Nat. Prod. Rep.* **2008**, 25, 794.

Hemiterpenes

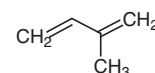
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2-Methyl-3-buten-2-ol
CAS RN: 115-18-4

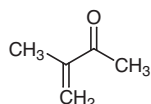
A1136 1g 5g

Angelic Acid
CAS RN: 565-63-9

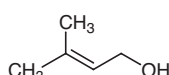
I0160 25mL 500mL

Isoprene
(stabilized with TBC)
CAS RN: 78-79-5

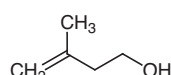
M0378 25mL

3-Methyl-3-buten-2-one
(stabilized with HQ)
CAS RN: 814-78-8

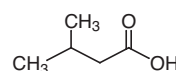
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3-Methyl-2-buten-1-ol
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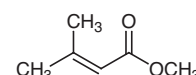
M0726 25mL 100mL 500mL

3-Methyl-3-buten-1-ol
CAS RN: 763-32-6

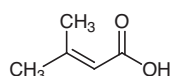
M0182 25mL 500mL

Isovaleric Acid
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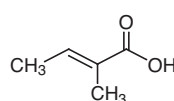
M2052 25g

Methyl 3,3-Dimethylacrylate
CAS RN: 924-50-5

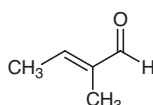
M0543 25g 100g 500g

3-Methylcrotonic Acid
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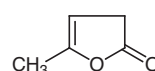
T0246 25g 100g

Tiglic Acid
CAS RN: 80-59-1

T1003 5mL 25mL

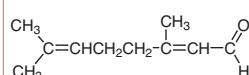
trans-2-Methyl-2-butenal
CAS RN: 497-03-0

A1090 25g 100g

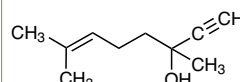
α-Angelicalactone
CAS RN: 591-12-8

Acyclic Monoterpenes

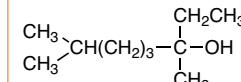
D0762 25mL

Citral (cis- and trans- mixture)
CAS RN: 5392-40-5

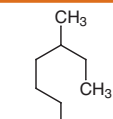
D5752 25mL 100mL

(±)-Dehydrolinalool
CAS RN: 29171-20-8

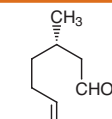
T0991 25mL 500mL

Tetrahydrolinalool
CAS RN: 78-69-3

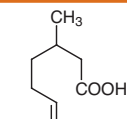
D1212 1mL

2,6-Dimethyloctane
CAS RN: 2051-30-1

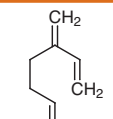
C1454 5mL 25mL

(-)-Citronellal
CAS RN: 5949-05-3

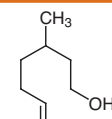
C1708 25mL

Citronellic Acid
CAS RN: 502-47-6

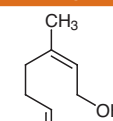
M0235 25mL 500mL

Myrcene (stabilized with BHT)
CAS RN: 123-35-3

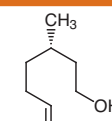
C0370 25mL 100mL 500mL

β-Citronellol
CAS RN: 106-22-9

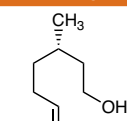
N0077 25mL 500mL

Nerol
CAS RN: 106-25-2

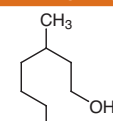
C1466 25mL

(-)-β-Citronellol (>95.0%)
CAS RN: 7540-51-4

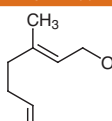
C3619 5mL 25mL

(-)-β-Citronellol (>98.0%)
CAS RN: 7540-51-4

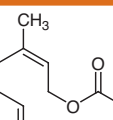
D1442 25mL 500mL

3,7-Dimethyl-1-octanol
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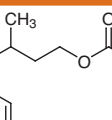
G0027 25mL 100mL 500mL

Geraniol
CAS RN: 106-24-1

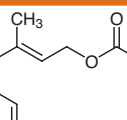
N0463 25mL

Neryl Acetate
CAS RN: 141-12-8

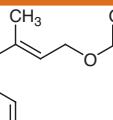
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Citronellyl Acetate
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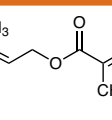
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Geranyl Acetate
CAS RN: 105-87-3

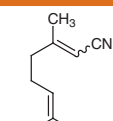
G0218 25mL

Geranyl Formate
CAS RN: 105-86-2

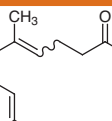
G0430 5mL 25mL

Geranyl Tiglate
CAS RN: 7785-33-3

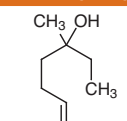
G0241 25mL

Geranyl Nitrile [mixture of (E)- and (Z)- isomers, (1:1)]
CAS RN: 5146-66-7

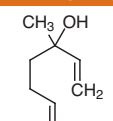
G0236 25mL

Geranylacetone [mixture of (E)- and (Z)- isomers, (3:2)]
CAS RN: 689-67-8

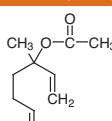
D1592 25mL 500mL

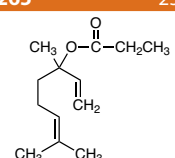
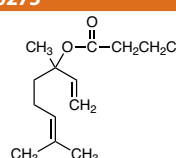
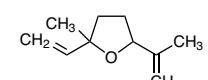
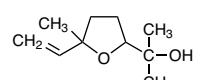
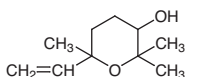
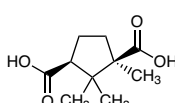
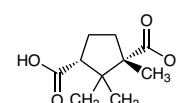
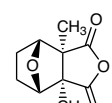
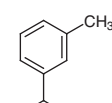
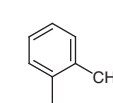
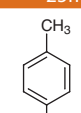
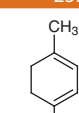
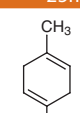
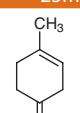
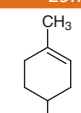
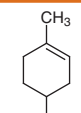
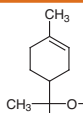
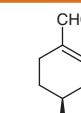
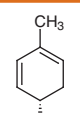
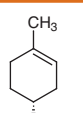
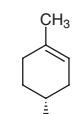
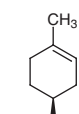
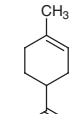
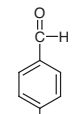
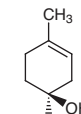
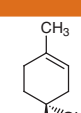
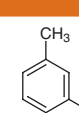
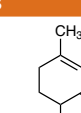
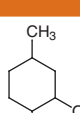
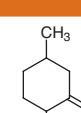
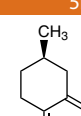
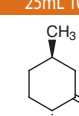
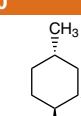
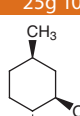
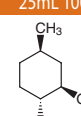
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CAS RN: 18479-51-1

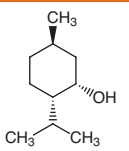
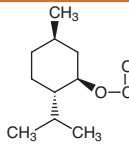
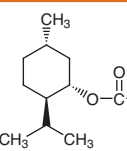
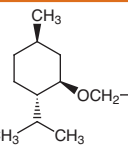
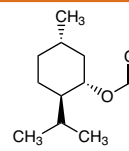
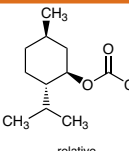
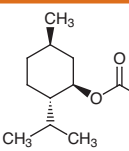
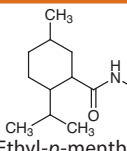
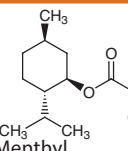
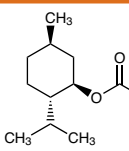
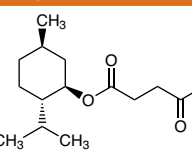
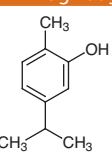
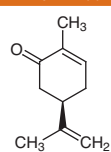
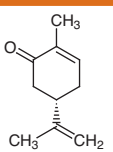
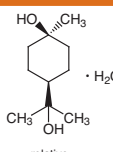
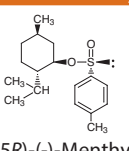
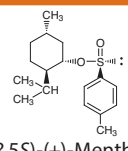
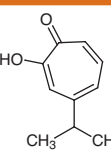
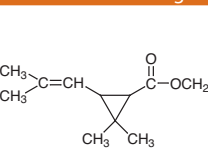
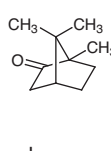
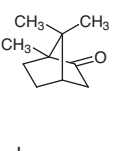
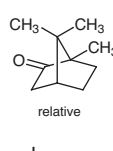
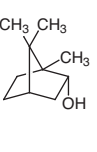
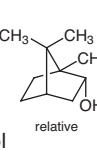
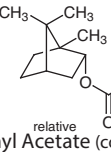
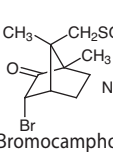
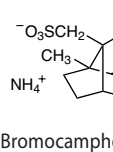
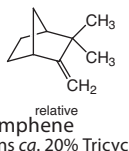
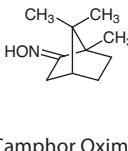
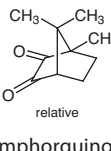
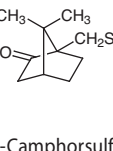
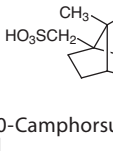
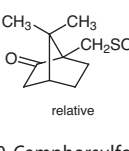
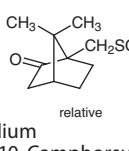
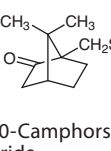
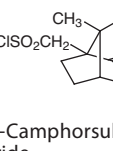
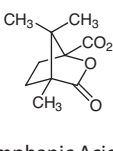
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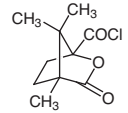
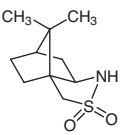
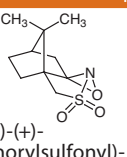
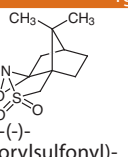
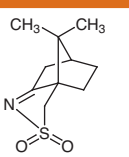
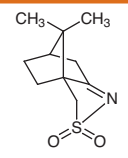
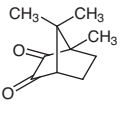
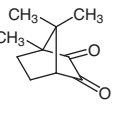
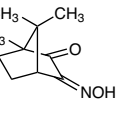
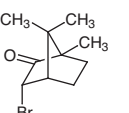
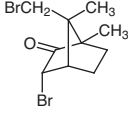
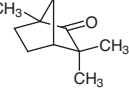
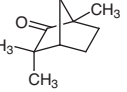
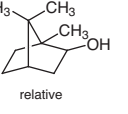
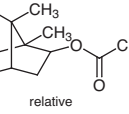
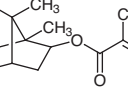
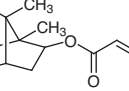
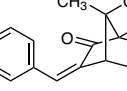
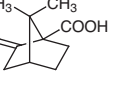
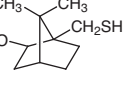
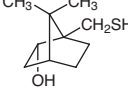
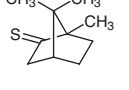
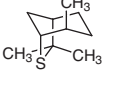
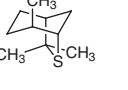
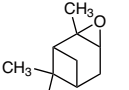
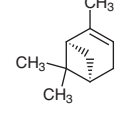
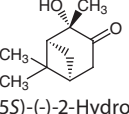
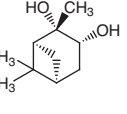
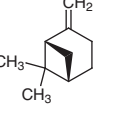
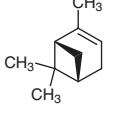
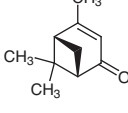
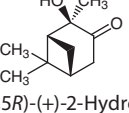
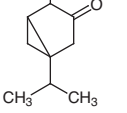
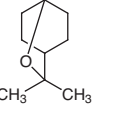
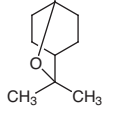
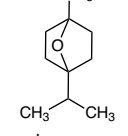
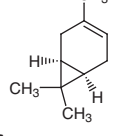
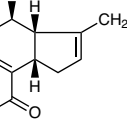
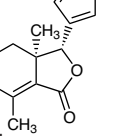
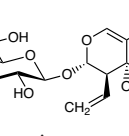
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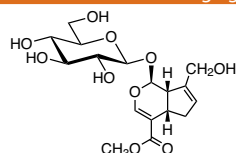
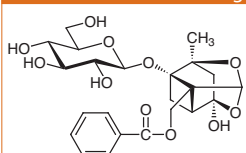
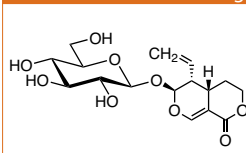
L0049 25mL 500mL

Linalyl Acetate
CAS RN: 115-95-7

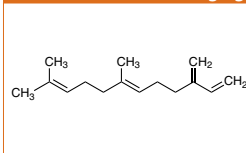
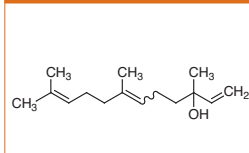
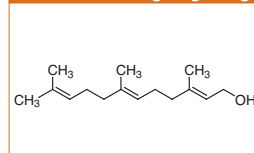
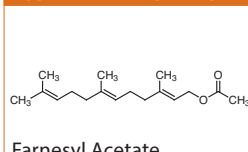
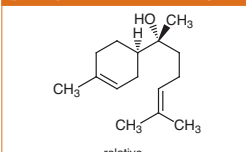
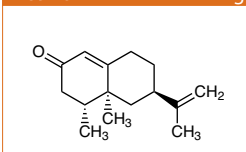
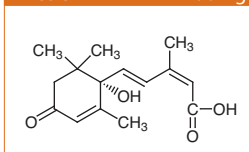
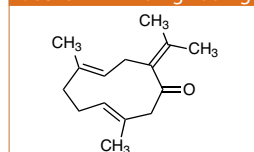
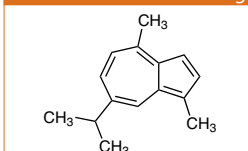
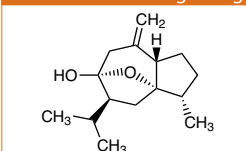
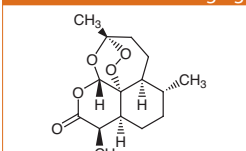
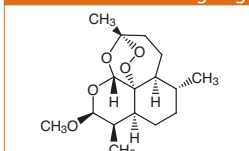
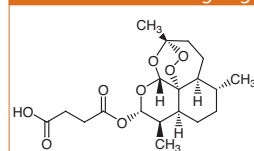
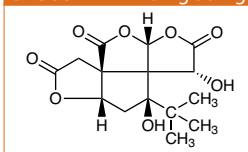
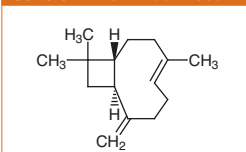
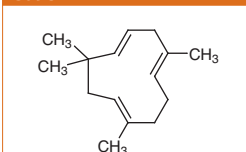
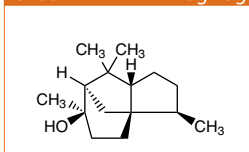
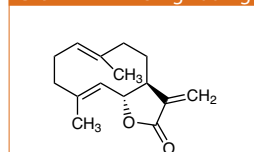
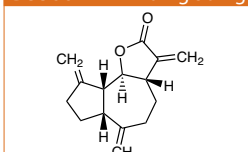
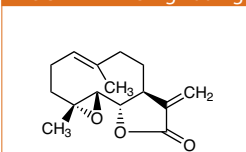
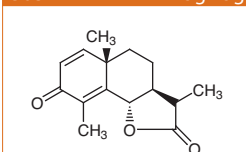
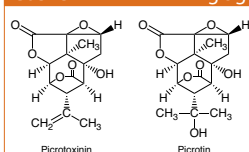
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Monocyclic Monoterpenes				
I0744 25g  Dehydroxylinalool Oxide (mixture of isomers) CAS RN: 13679-86-2	L0143 25mL  Linalool Oxide (mixture of isomers) CAS RN: 60047-17-8	T2605 25g  Linalool Oxide Pyranoid (mixture of isomers) CAS RN: 14049-11-7		
C0012 25g 100g  (+)-Camphoric Acid CAS RN: 124-83-4	C3237 1g  (1S,3R)-(-)-Camphoric Acid CAS RN: 560-09-8	C0019 25mg 100mg  Cantharidin CAS RN: 56-25-7	C0798 0.1mL 1mL  <i>m</i> -Cymene CAS RN: 535-77-3	C0799 0.1mL  <i>o</i> -Cymene CAS RN: 527-84-4
C0513 25mL 500mL  <i>p</i> -Cymene CAS RN: 99-87-6	M0317 25mL 500mL  α-Terpinene CAS RN: 99-86-5	M0318 25mL 500mL  γ-Terpinene CAS RN: 99-85-4	T0817 25mL 500mL  Terpinolene CAS RN: 586-62-9	T0022 25mL 500mL  α-Terpineol (>80.0%) CAS RN: 98-55-5
T0984 25mL 100mL 500mL  α-Terpineol (>95.0%) CAS RN: 98-55-5	T0023 25mL 500mL  Terpinyl Acetate (mixture of isomers) CAS RN: 80-26-2	P0866 5mL 25mL  (-)-Perillaldehyde CAS RN: 18031-40-8	M0051 5mL 25mL  (-)-α-Phellandrene CAS RN: 4221-98-1	L0047 25mL 500mL  (+)-Limonene (>95.0%) CAS RN: 5989-27-5
L0105 5mL 25mL  (+)-Limonene (>99.0%) CAS RN: 5989-27-5	L0132 5mL 25mL 500mL  (-)-Limonene (>95.0%) CAS RN: 5989-54-8	L0046 25mL 500mL  (±)-Limonene CAS RN: 138-86-3	I0168 25g 500g  Cuminaldehyde CAS RN: 122-03-2	T2581 5g 25g  (+)-Terpinen-4-ol CAS RN: 2438-10-0
M0319 25mL  (-)-Terpinen-4-ol (contains 30% (+)-Terpinen-4-ol at maximum) CAS RN: 20126-76-5	M0410 25g 500g  Thymol CAS RN: 89-83-8	P1783 25g 100g  Piperitone (mixture of enantiomers, predominantly (R)-(-)-form) CAS RN: 4573-50-6	M0320 25mL  Isopulegol (mixture of isomers) CAS RN: 7786-67-6	M2023 5g  8-Mercaptomenthone CAS RN: 38462-22-5
P2331 5mL 25mL  (+)-Pulegone CAS RN: 89-82-7	M0513 25mL 100mL 500mL  (-)-Menthone CAS RN: 14073-97-3	M3170 25g 100g  (+)-Menthol CAS RN: 15356-60-2	M0545 25g 100g 500g  (-)-Menthol CAS RN: 2216-51-5	M0321 25mL 100mL 500mL  (±)-Menthol CAS RN: 89-78-1

N0626 5mL 25mL  (+)-Neomenthol CAS RN: 2216-52-6	M0990 5mL 25mL  (-)-Menthyl Chloroformate CAS RN: 14602-86-9	M1221 5mL 25mL  (+)-Menthyl Chloroformate CAS RN: 7635-54-3	M0573 5g 25g  (-)-Menthoxylacetic Acid CAS RN: 40248-63-3	M2631 1mL 5mL  (+)-Menthyl Acetate CAS RN: 5157-89-1
M3399 25g  (±)-Menthyl Acetate CAS RN: 89-48-5	A1107 25mL  (-)-Menthyl Acetate CAS RN: 2623-23-6	E0796 5g 25g  N-Ethyl-p-menthane-3-carboxamide CAS RN: 39711-79-0	I0790 25g  (-)-Menthyl 2,2-Dihydroxyacetate CAS RN: 111969-64-3	I0889 5g 25g  L-Menthyl L-Lactate CAS RN: 61597-98-6
M2482 25g  (-)-Menthyl Succinate CAS RN: 77341-67-4	C0026 25g 100g 500g  Carvacrol CAS RN: 499-75-2	C0703 25mL 100mL 500mL  (R)-(-)-Carvone CAS RN: 6485-40-1	C0704 25mL  (5)-(-)-Carvone CAS RN: 2244-16-8	T2344 25g  Terpin Monohydrate CAS RN: 2451-01-6
M1044 5g 25g  (1R,2S,5R)-(-)-Menthyl (S)-p-Toluenesulfinate CAS RN: 1517-82-4	M1066 1g 5g  (1S,2R,5S)-(+)-Menthyl (R)-p-Toluenesulfinate CAS RN: 91796-57-5	H0142 1g 5g  Hinokitiol CAS RN: 499-44-5	D2112 25g 100g  Ethyl Chrysanthemate CAS RN: 97-41-6	
Bicyclic Monoterpenes				
C0010 25g 500g  (+)-Camphor CAS RN: 464-49-3	C1251 5g  (-)-Camphor CAS RN: 464-48-2	C0011 25g 500g  (±)-Camphor CAS RN: 76-22-2		
B1012 25g 500g  (-)-Borneol CAS RN: 464-45-9	B0525 25g 500g  Borneol (contains ca. 20% Isoborneol) CAS RN: 507-70-0	B0526 25mL  Bornyl Acetate (contains ca. 20% Isobornyl Acetate) CAS RN: 5655-61-8	B1125 5g 25g  (+)-3-Bromocamphor-8-sulfonic Acid Ammonium Salt CAS RN: 14575-84-9	B4412 1g 5g  (-)-3-Bromocamphor-8-sulfonic Acid Ammonium Salt CAS RN: 55870-50-3
C0009 25g 100g  (±)-Camphene (contains ca. 20% Tricyclene) CAS RN: 79-92-5	C0013 1g 5g 25g  (1R)-Camphor Oxime CAS RN: 2792-42-9	C0014 5g 25g  (±)-Camphorquinone CAS RN: 10373-78-1	C0015 25g 100g 500g  (+)-10-Camphorsulfonic Acid CAS RN: 3144-16-9	C0972 25g 100g 500g  (-)-10-Camphorsulfonic Acid CAS RN: 35963-20-3
C0016 25g 100g 500g  (±)-10-Camphorsulfonic Acid CAS RN: 5872-08-2	C0017 25g  Sodium (±)-10-Camphorsulfonate CAS RN: 34850-66-3	C0998 5g 25g  (+)-10-Camphorsulfonyl Chloride CAS RN: 21286-54-4	C1308 5g 25g  (-)-10-Camphorsulfonyl Chloride CAS RN: 39262-22-1	C1021 1g 5g  (-)-Camphanic Acid CAS RN: 13429-83-9

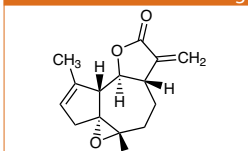
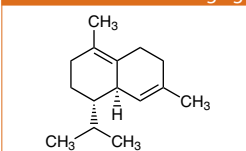
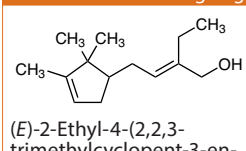
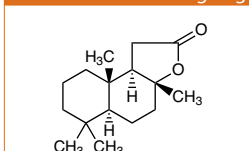
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C1393 5g  (-)-10-Camphorsulfonylimine CAS RN: 60886-80-8	C1482 1g 5g  (1R)-(-)-Camphorquinone CAS RN: 10334-26-6	C1660 1g 5g  (1S)-(+)-Camphorquinone CAS RN: 2767-84-2	C1661 1g  <i>anti</i> -(1R)-(+)-Camphorquinone 3-Oxime CAS RN: 31571-14-9	B0567 25g  (+)-3-Bromocamphor CAS RN: 10293-06-8
D2715 5g 25g  (+)-3,9-Dibromocamphor CAS RN: 10293-10-4	F0163 25mL  (+)-Fenchone CAS RN: 4695-62-9	F0164 25mL 500mL  (-)-Fenchone CAS RN: 7787-20-4	I0275 25g 500g  (±)-Isoborneol CAS RN: 124-76-5	I0306 25mL 500mL  Isobornyl Acetate CAS RN: 125-12-2
I0617 25g 500g  relative Isobornyl Methacrylate (stabilized with MEHQ) CAS RN: 7534-94-3	I0638 25g 500g  relative Isobornyl Acrylate (stabilized with MEHQ) CAS RN: 5888-33-5	M3357 25g 200g  3-(4-Methylbenzylidene)-camphor CAS RN: 36861-47-9	K0028 1g 5g  (S)-(+)-Ketopinic Acid CAS RN: 40724-67-2	M1070 1g  (1S)-(-)-10-Mercaptoisoborneol CAS RN: 71242-58-5
M1341 100mg  (1S)-(-)-10-Mercaptoisoborneol CAS RN: 71242-59-6	T1863 1g 5g  (1R)-(-)-Thiocamphor CAS RN: 53402-10-1	T2578 1g 5g  (1R,4R,5R)-4,7,7-Trimethyl-6-thiabicyclo[3.2.1]octane CAS RN: 5718-75-2	T2579 1g 5g  (1S,4S,5S)-4,7,7-Trimethyl-6-thiabicyclo[3.2.1]octane CAS RN: 1208985-45-8	P1362 25mL 250mL  α-Pinene Oxide CAS RN: 1686-14-2
P1099 25mL 500mL  (1R)-(+)-α-Pinene CAS RN: 7785-70-8	H0863 1g 5g  (1S,2S,5S)-(-)-2-Hydroxy-3-pinanone CAS RN: 1845-25-6	P1934 5g 25g  (1S,2S,3R,5S)-(+)-2,3-Pinane diol CAS RN: 18680-27-8	P0441 25mL 500mL  (-)-β-Pinene CAS RN: 18172-67-3	P0440 25mL 500mL  (1S)-(-)-α-Pinene CAS RN: 7785-26-4
V0072 25g  (-)-Verbenone CAS RN: 1196-01-6	H0862 1g 5g  (1R,2R,5R)-(+)-2-Hydroxy-3-pinanone CAS RN: 24047-72-1	T0989 5mL 25mL  Thujone (α- and β- mixture) CAS RN: 1125-12-8	C0542 25mL  1,8-Cineole (>99.0%) CAS RN: 470-82-6	C0934 25mL 100mL 500mL  1,8-Cineole (>98.0%) CAS RN: 470-82-6
C3652 25g 100g  1,4-Cineole CAS RN: 470-67-7	C0047 25mL 500mL  (+)-3-Carene CAS RN: 498-15-7	G0458 25mg 100mg  Genipin CAS RN: 6902-77-8	F1187 10mg 50mg  Fraxinellone CAS RN: 28808-62-0	S0897 25mg  Swertiamarin CAS RN: 17388-39-5

G0385 100mg 1gGeniposide
CAS RN: 24512-63-8**P1876** 100mgPaeoniflorin
CAS RN: 23180-57-6**W0022** 10mg(-)-Sweroside
CAS RN: 14215-86-2

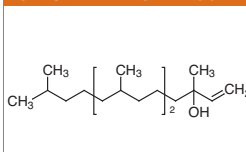
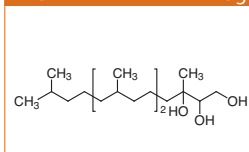
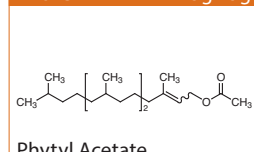
Sesquiterpenes

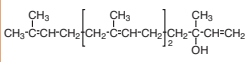
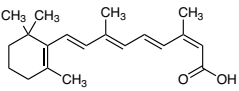
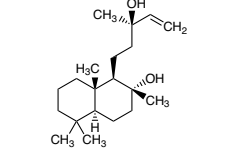
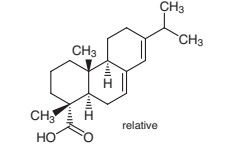
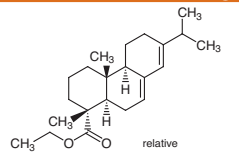
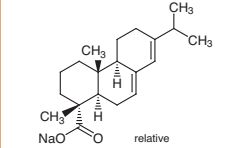
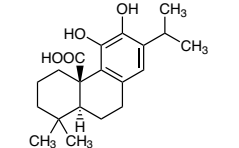
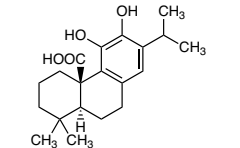
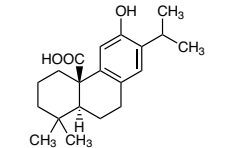
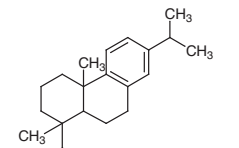
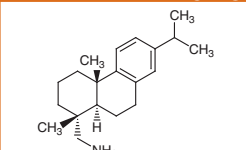
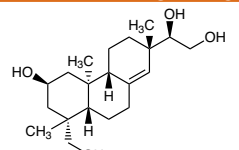
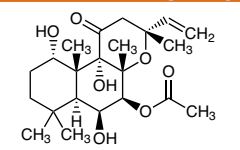
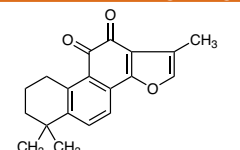
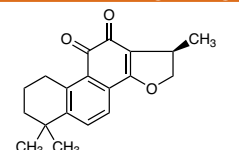
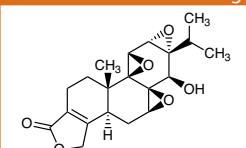
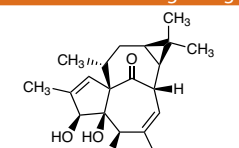
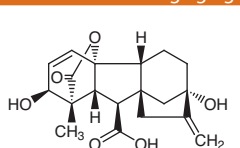
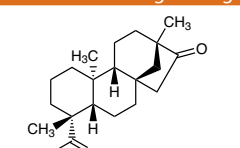
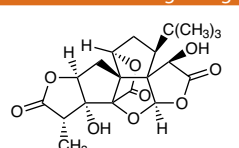
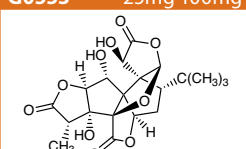
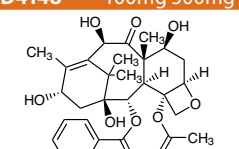
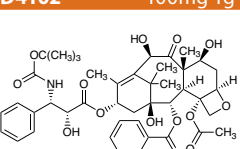
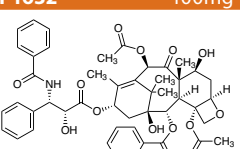
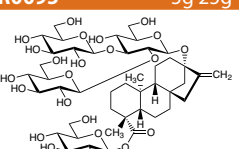
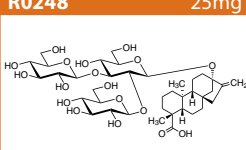
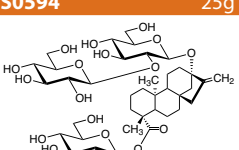
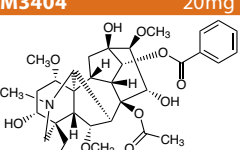
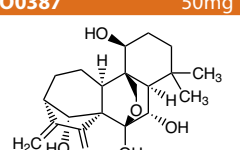
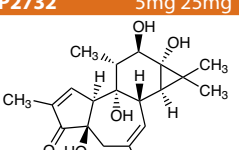
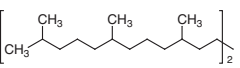
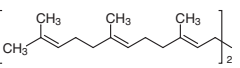
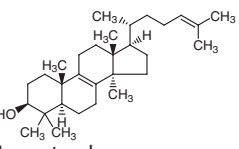
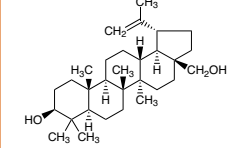
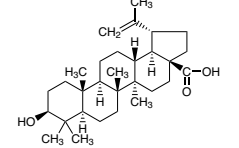
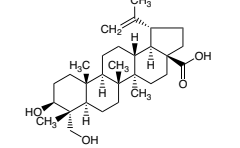
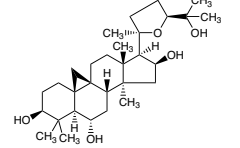
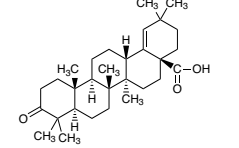
F1305 250mg 1g*trans*-β-Farnesene
CAS RN: 18794-84-8**N0454** 25mLNerolidol (*cis*- and *trans*- mixture)
CAS RN: 7212-44-4**T0608** 5g 25g 100gFarnesol (mixture of isomers)
CAS RN: 4602-84-0**F0347** 5mL 25mLFarnesyl Acetate
(mixture of isomers)
CAS RN: 29548-30-9**B2119** 25mL(±)-α-Bisabolol
CAS RN: 515-69-5**N0920** 1g(+) -Nootkatone
CAS RN: 4674-50-4**A1698** 100mg(S)-(-)-Absciscic Acid
CAS RN: 21293-29-8**G0519** 20mg 100mgGermacrone
CAS RN: 6902-91-6**G0228** 10gGuaiazulene
CAS RN: 489-84-9**C3439** 10mg 50mgCurcuminol
CAS RN: 4871-97-0**A2118** 1g 5gArtemisinin
CAS RN: 63968-64-9**A2190** 5g 25gArtemether
CAS RN: 71963-77-4**A2191** 5g 25gArtesunate
CAS RN: 88495-63-0**B4388** 10mg 50mgBilobalide
CAS RN: 33570-04-6**C0796** 25mL 100mL 500mLβ-Caryophyllene
CAS RN: 87-44-5**C0957** 1mLα-Caryophyllene
CAS RN: 6753-98-6**C2854** 5g 25gCedrol
CAS RN: 77-53-2**C2921** 25mg 100mgCostunolide
CAS RN: 553-21-9**D5366** 10mg 50mgDehydrocostus Lactone
CAS RN: 477-43-0**P1982** 25mg 100mgParthenolide
CAS RN: 20554-84-1**S0521** 5g 25gSantonin
CAS RN: 481-06-1**C0375** 1g 5gPicrotoxin (Picrotoxinin + Picrotin)
CAS RN: 124-87-8**B1413** 25mL

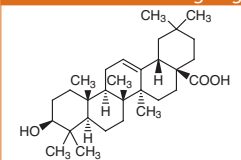
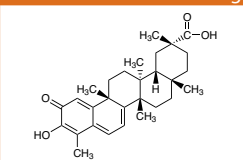
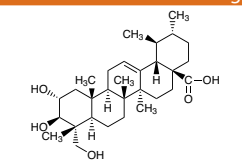
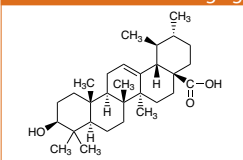
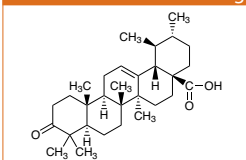
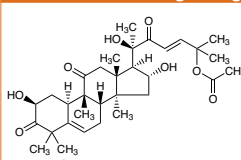
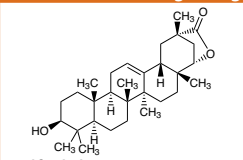
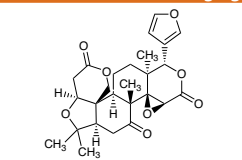
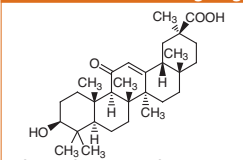
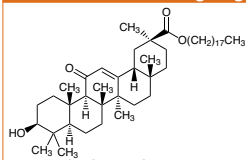
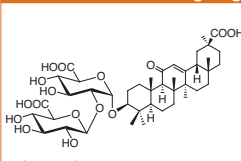
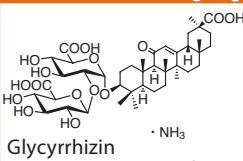
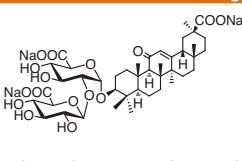
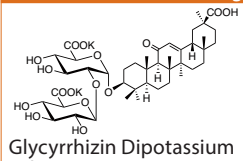
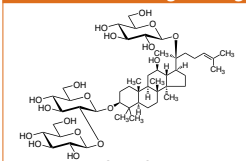
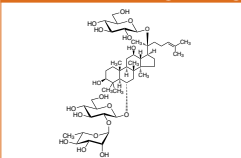
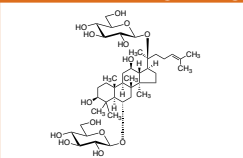
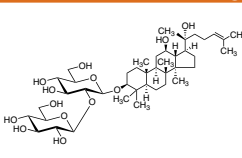
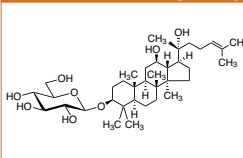
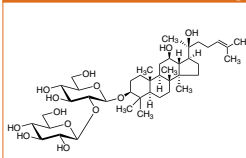
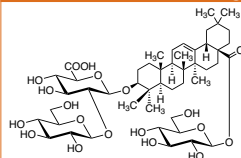
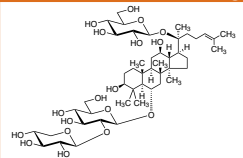
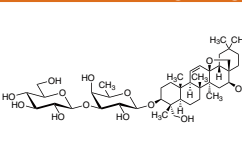
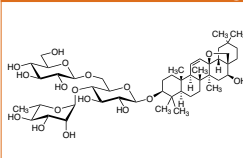
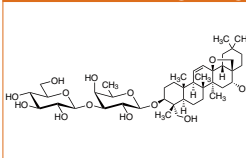
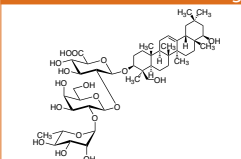
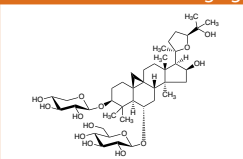
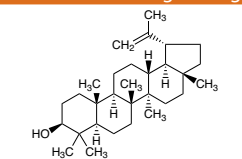
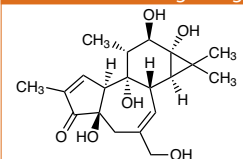
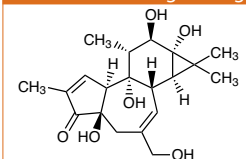
Bisabolene (mixture)

A3449 5mgArglabin
CAS RN: 84692-91-1**C3734** 250mg 1g(+) -δ-Cadinene
CAS RN: 483-76-1**E1422** 5g 25g(E)-2-Ethyl-4-(2,2,3-trimethylcyclopent-3-en-1-yl)but-2-en-1-ol
CAS RN: 106185-75-5**S0847** 5g 25g(3aR)-(+)-Sclareolide
CAS RN: 564-20-5

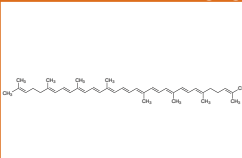
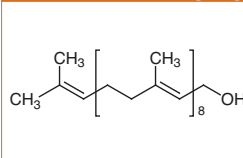
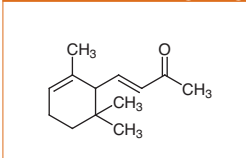
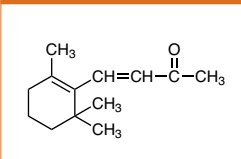
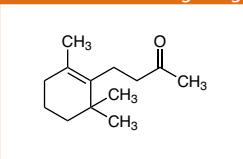
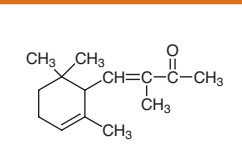
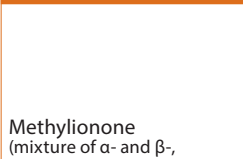
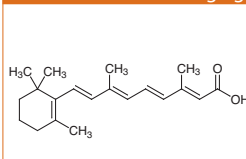
Diterpenes

I0145 25mL 100mLIsophytol
CAS RN: 505-32-8**P1674** 5gPhytantriol (mixture of isomers)
CAS RN: 74563-64-7**P1675** 5g 25gPhytyl Acetate
(*cis*- and *trans*- mixture)
CAS RN: 10236-16-5

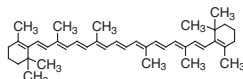
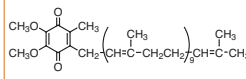
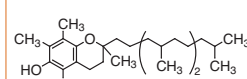
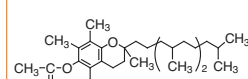
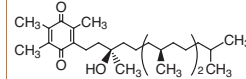
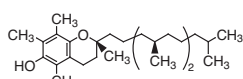
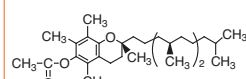
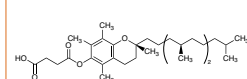
G0221 25mL  Geranyl-linalool (mixture of isomers) CAS RN: 68931-30-6	R0088 100mg 1g  13-cis-Retinoic Acid CAS RN: 4759-48-2	S0916 1g 5g  Sclareol CAS RN: 515-03-7	A0001 25g 500g  Abietic Acid CAS RN: 514-10-3	A0002 25g  Ethyl Abietate CAS RN: 631-71-0
A0651 5g 25g  Sodium Abietate CAS RN: 14351-66-7	C2488 20mg 100mg  Carnosic Acid (Synthetic) CAS RN: 3650-09-7	C3477 20mg 100mg  Carnosic Acid CAS RN: 3650-09-7	P1933 100mg  Piferic Acid CAS RN: 67494-15-9	D1180 25g 500g  Dehydroabietylamine
D1588 5g 25g  (+)-Dehydroabietylamine CAS RN: 1446-61-3	K0059 25mg 100mg  Kirenol CAS RN: 52659-56-0	F0855 10mg 50mg  Forskolol CAS RN: 66575-29-9	T2987 10mg 50mg  Tanshinone IIA CAS RN: 568-72-9	C3363 25mg 100mg  Cryptotanshinone CAS RN: 35825-57-1
T2899 10mg  Triptolide CAS RN: 38748-32-2	I1112 10mg 50mg  Ingenol CAS RN: 30220-46-3	G0029 100mg 1g 5g  Gibberellin A3 CAS RN: 77-06-5	I1069 100mg 500mg  Isosteviol CAS RN: 27975-19-5	G0521 10mg 50mg  Ginkgolide A CAS RN: 15291-75-5
G0553 25mg 100mg  Ginkgolide B CAS RN: 15291-77-7	D4148 100mg 500mg  10-Deacetylbaicatin III CAS RN: 32981-86-5	D4102 100mg 1g  Docetaxel CAS RN: 114977-28-5	P1632 100mg  Paclitaxel CAS RN: 33069-62-4	R0095 5g 25g  Rebaudioside A CAS RN: 58543-16-1
R0248 25mg  Rebaudioside B CAS RN: 58543-17-2	S0594 25g  Stevioside CAS RN: 57817-89-7	M3404 20mg  Mesaconitine CAS RN: 2752-64-9	O0387 50mg  Oridonine CAS RN: 28957-04-2	P2732 5mg 25mg  Phorbol CAS RN: 17673-25-5
Triterpenes				
H0096 25mL 100mL 500mL  Squalane CAS RN: 111-01-3				
H0097 25mL 100mL 500mL  Squalene CAS RN: 111-02-4				
C0427 25g  Lanosterol CAS RN: 79-63-0				
B0803 100mg  Betulinol CAS RN: 473-98-3	B2836 100mg 1g  Betulinic Acid CAS RN: 472-15-1	H1742 5mg 25mg  23-Hydroxybetulinic Acid CAS RN: 85999-40-2	C3469 25mg 100mg  Cycloastragenol CAS RN: 78574-94-4	M2610 5mg 25mg  Moronic Acid CAS RN: 6713-27-5

O0317 5g 25g**C2737** 25mg**A2475** 200mg**U0065** 100mg 1g**O0508** 100mg**C3442** 5mg 25mg**W0011** 5mg 25mg**L0258** 100mg 1g**G0149** 1g 25g**S0988** 5g 25g**G0150** 1g 25g**G0151** 1g 25g**G0217** 25g**G0270** 25g**G0550** 25mg 100mg**G0551** 50mg 250mg**G0533** 25mg 100mg**G0536** 50mg**G0567** 5mg 25mg**G0568** 10mg**G0586** 25mg**N1129** 50mg**A3408** 10mg 50mg**A3189** 25mg**A3405** 10mg 50mg**O0587** 10mg**A3305** 250mg 1g**L0321** 25mg 100mg**P2732** 5mg 25mg**P2811** 50mg 250mg

Other Terpenes

L0257 250mg 1g**S0525** 5g 25g**I0076** 25g 250g**I0077** 25mL 100mL 500mL**D5751** 25g 100g**M0647** 25mL**M0363** 25mL**R0064** 1g 5g

Terpenes

C0560 1g 5g  β-Carotene CAS RN: 7235-40-7	C1971 100mg 1g  Coenzyme Q₁₀ CAS RN: 303-98-0	T0251 25g 250g  DL-α-Tocopherol CAS RN: 10191-41-0	T0252 25g 100g 500g  DL-α-Tocopherol Acetate CAS RN: 7695-91-2	T2283 500mg  D-α-Tocopherylquinone CAS RN: 7559-04-8
T2309 25g  D-α-Tocopherol CAS RN: 59-02-9	T2322 25g  D-α-Tocopherol Acetate CAS RN: 58-95-7	T2628 5g 25g  D-α-Tocopherol Succinate CAS RN: 4345-03-3	C0781 25g Capsanthin (=Paprika Extract) (Vegetable oil solution) CAS RN: 465-42-9	C1527 25g Crocin (Gardenia Fruits Extract) CAS RN: 42553-65-1

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