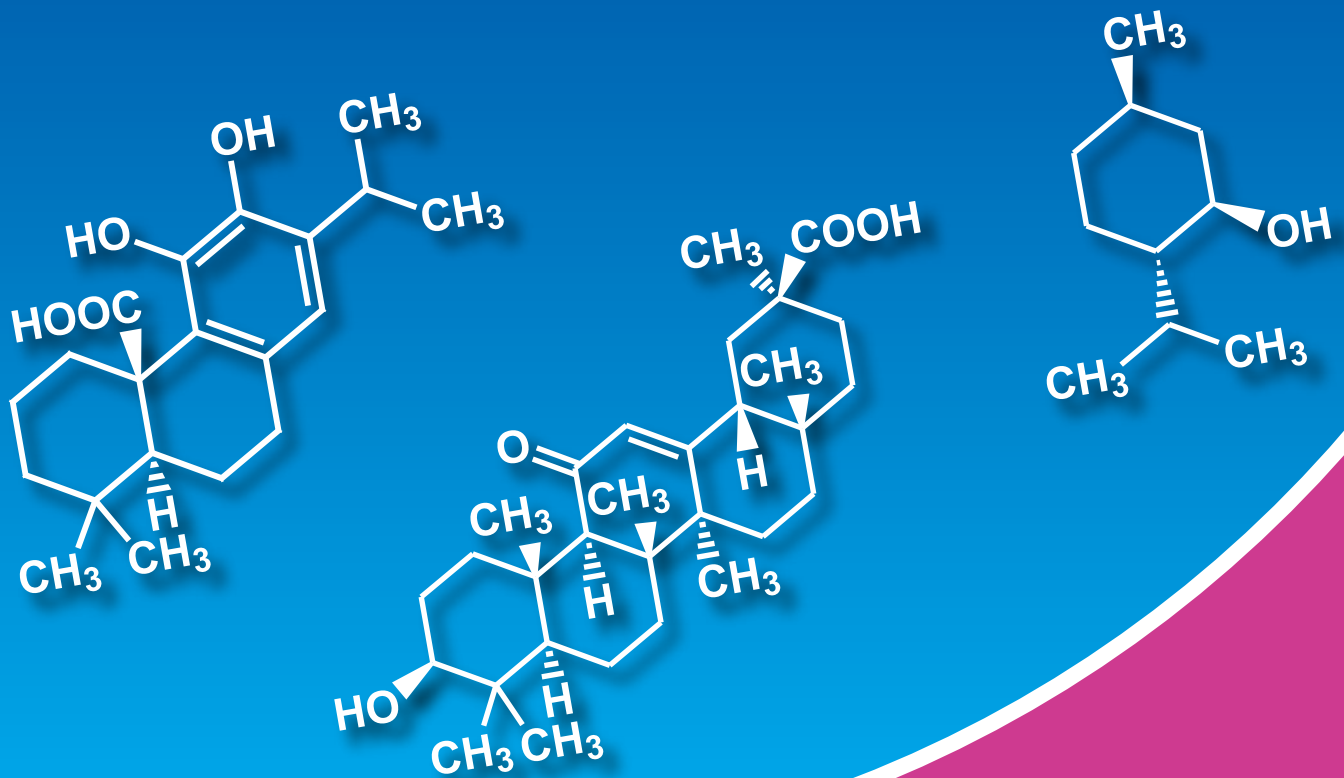


# テルペン

Terpenes



ヘミテルペン

非環式モノテルペン

単環式モノテルペン

二環式モノテルペン

セスキテルペン

ジテルペン

トリテルペン

その他のテルペン

# テルペン

テルペンは植物の精油に含まれる成分として知られており、その化学構造は炭素数5のイソプレンを単位とした天然物の一群です。メバロン酸経路で生合成され、イソペンテニルピロリン酸がhead-to-tailで結合したタイプの化合物です<sup>1,2)</sup>。炭素鎖の長さに応じて以下のように分類されます。

表1\_テルペンの炭素数と代表的化合物

名称	炭素数	例
ヘミテルペン	5	イソプレン
モノテルペン	10	メントール・グラニオール：香料・食品添加物
セスキテルペン	15	アルテミシニン：抗マラリア薬、 $\alpha$ -ピサボロール：香料・化粧品成分
ジテルペン	20	パクリタキセル：抗腫瘍剤、ジベレリン：植物ホルモン
トリテルペン	30	ラノステロール：ステロイドの生合成前駆体

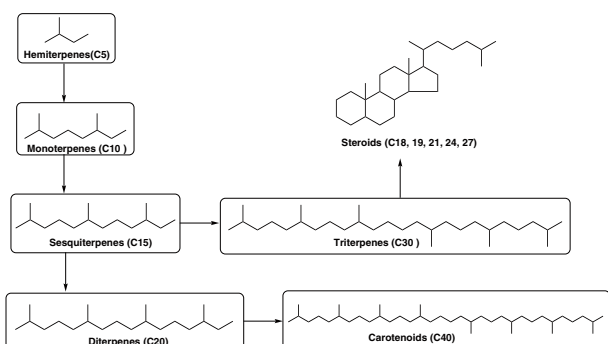


図1 テルペンの炭素骨格の生合成経路

テルペンは海洋生物から植物まで幅広く存在し、抗腫瘍活性など多彩な生理活性を有するものが多く、その作用機序については現在研究が盛んに行われています。また、主として植物に存在することから、植物を用いたメタボローム解析における指標としても使われています。

## ●命名法

IUPAC命名法付録に記載されているテルペンの基本骨格は42個あります<sup>3)</sup>。実際にはこれ以外の慣用的な名称もよく用いられることがあります。慣用名については成書または総説<sup>2,4)</sup>に紹介されています。

## ●溶解度

配糖体を除いて水に不溶です。一般に有機溶媒に可溶です。酸素官能基が増え、極性が高くなってくるとヘキサンのような無極性溶媒には溶けにくくなります。細胞への添加実験の場合にはDMSO溶液で添加するのが一般的です。

## ●安定性

一般に以下のような傾向があります：モノテルペンは比較的安定。油状のセスキテルペン、ジテルペンは酸素官能基が増えるにつれ、長期保管には不適です。トリテルペンは固体のものがほとんどで安定性は良好です。

## ●検出法

発色団をもたない化合物も多く、順相HPLCでのUV検出は困難な場合があります。代わってRI（示差屈折率）検出器が用いられます。順相の薄層クロマトグラフィーも汎用され、りんモリブデン酸溶液、硫酸セリウム溶液を噴霧して、加熱発色させて検出します。

## ●取扱い上の注意など

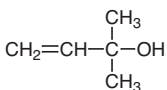
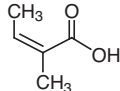
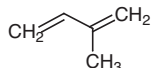
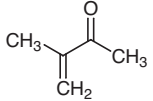
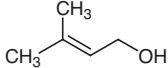
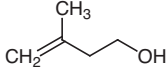
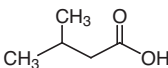
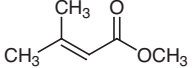
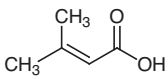
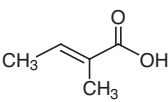
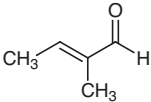
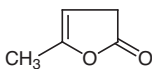
(主に天然物からの抽出実験の場合)

- モノテルペン、セスキテルペンは水分が混入したまま減圧下濃縮すると、水蒸気蒸留が起こり、揮発してしまうことがあります。事前に有機溶媒に溶解して、乾燥剤（硫酸ナトリウム、硫酸マグネシウム）を加えて十分に乾燥してから、適切な気圧と温度下で濃縮を行うとよいでしょう。
- NMR測定では重クロロホルム( $\text{CDCl}_3$ )と重ベンゼン( $\text{C}_6\text{D}_6$ )を溶媒として別々に測定すると、シグナルの分離パターンが変化し、解析しやすくなる場合があります。さらに、残存する水の信号が移動するため、重なっていたシグナルが現れてくる場合があります。
- $\text{CDCl}_3$ は保存中にホスゲンが発生する可能性があります。その影響で貴重な試料が分解してしまう恐れがあります。特に、重水素化率の高い $\text{CDCl}_3$ (99.95% D以上)を用いる場合はこの傾向が高く注意が必要です。貴重な試料の場合、チューブ中に溶液として保管するのではなく、都度試料管からサンプルを回収し濃縮乾固して保存されることをお勧めします。

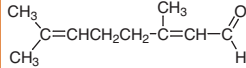
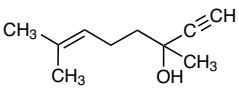
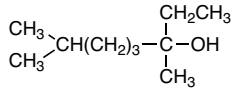
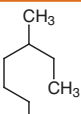
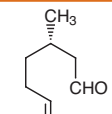
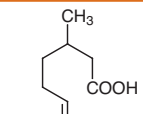
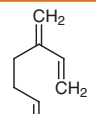
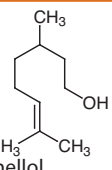
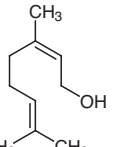
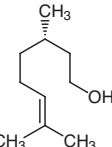
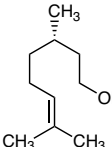
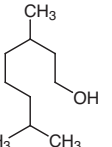
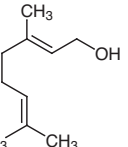
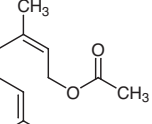
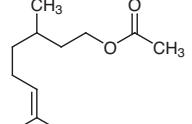
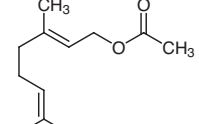
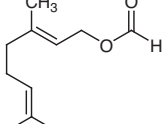
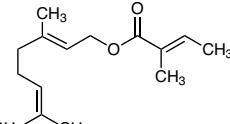
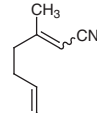
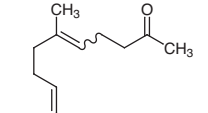
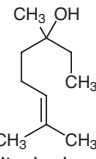
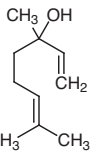
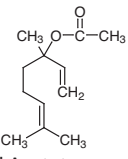
## 文献

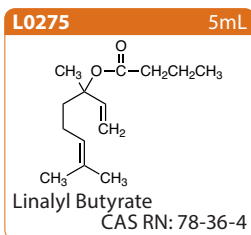
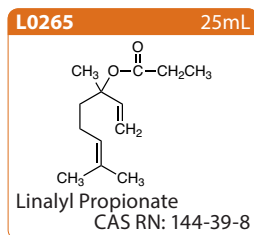
- P. M. Dewick, in *Medicinal Natural Products*, 3rd ed., John Wiley & Sons, Chichester, **2009**, p. 187.
- E. Breitmaier, in *Terpenes*, Wiley-VCH, Weinheim, **2006**.
- P. M. Gills Jr., *Pure Appl. Chem.* **1999**, 71, 587.
- a) For Sesquiterpenes: B. M. Fraga, *Nat. Prod. Rep.* **2008**, 25, 1180.  
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.

## ヘミテルペン

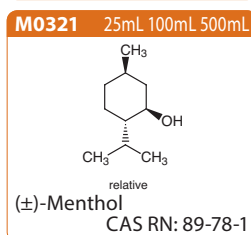
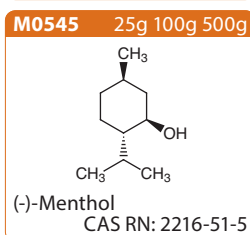
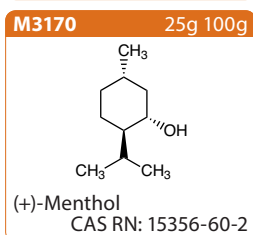
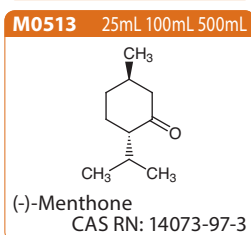
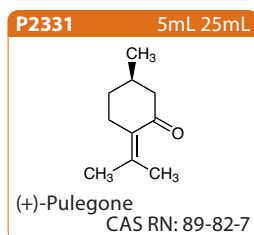
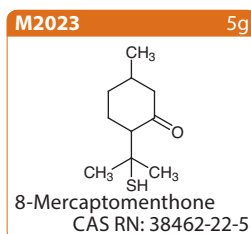
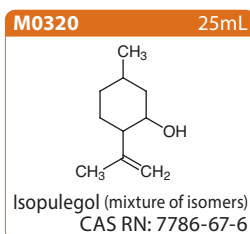
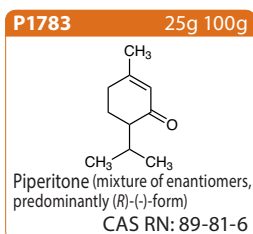
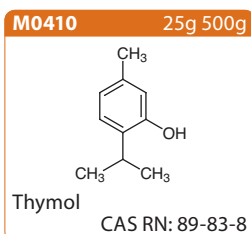
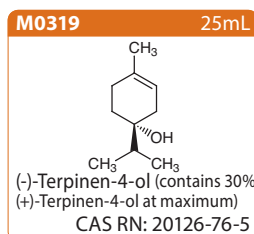
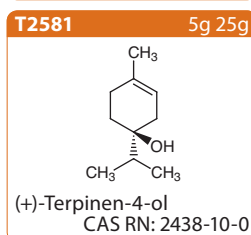
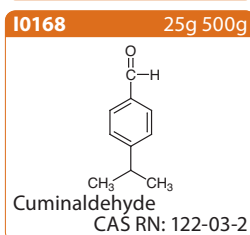
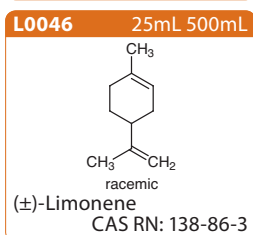
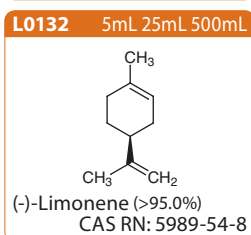
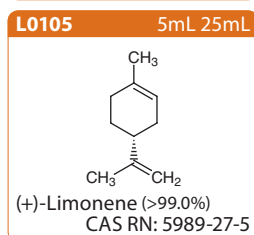
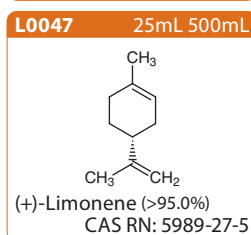
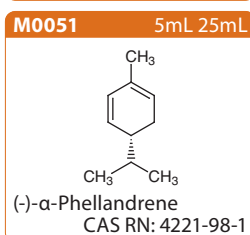
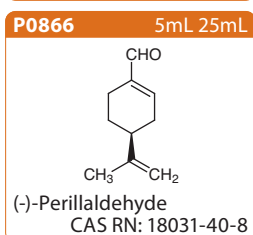
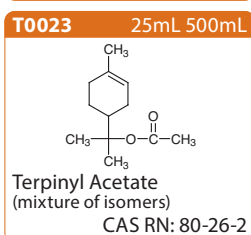
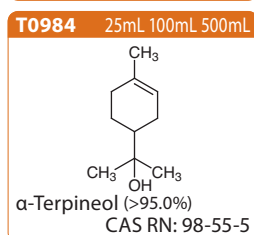
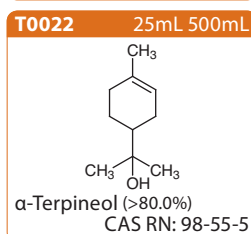
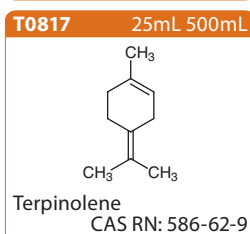
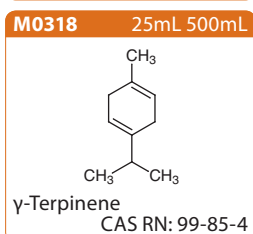
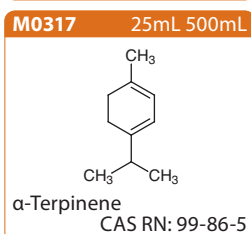
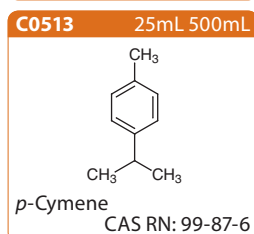
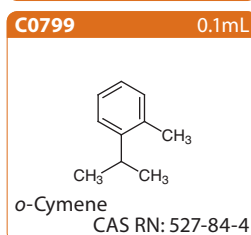
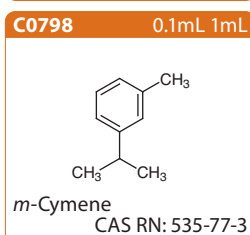
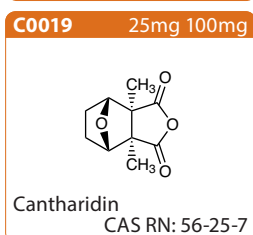
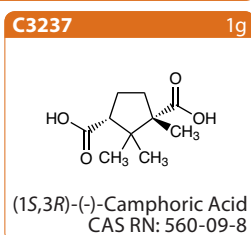
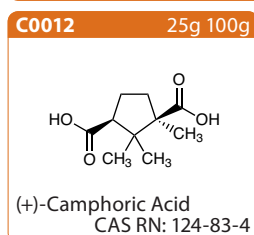
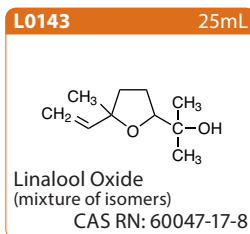
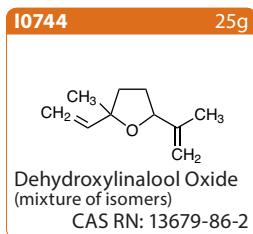
	<b>M0178</b> 25mL 500mL	<b>A1136</b> 1g 5g	<b>I0160</b> 25mL 500mL
	 2-Methyl-3-buten-2-ol CAS RN: 115-18-4	 Angelic Acid CAS RN: 565-63-9	 Isoprene (stabilized with TBC) CAS RN: 78-79-5
<b>M0378</b> 25mL	<b>M0714</b> 25mL 100mL 500mL	<b>M0726</b> 25mL 100mL 500mL	<b>M0182</b> 25mL 500mL
 3-Methyl-3-buten-2-one (stabilized with HQ) CAS RN: 814-78-8	 3-Methyl-2-buten-1-ol CAS RN: 556-82-1	 3-Methyl-3-buten-1-ol CAS RN: 763-32-6	 Isovaleric Acid CAS RN: 503-74-2
	<b>M2052</b> 25g		
	 Methyl 3,3-Dimethylacrylate CAS RN: 924-50-5		
<b>M0543</b> 25g 100g 500g	<b>T0246</b> 25g 100g	<b>T1003</b> 5mL 25mL	<b>A1090</b> 25g 100g
 3-Methylcrotonic Acid CAS RN: 541-47-9	 Tiglic Acid CAS RN: 80-59-1	 <i>trans</i> -2-Methyl-2-butenal CAS RN: 497-03-0	 $\alpha$ -Angelicalactone CAS RN: 591-12-8

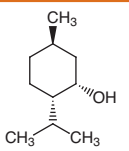
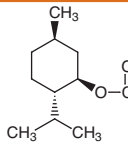
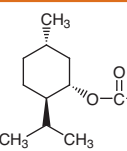
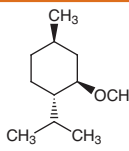
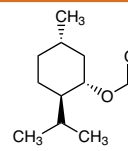
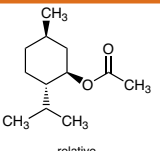
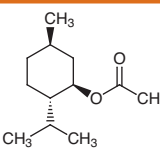
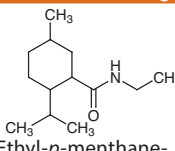
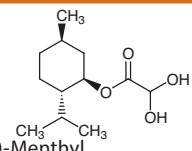
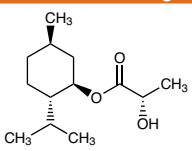
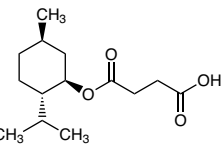
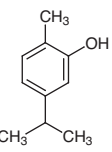
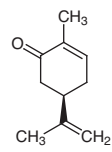
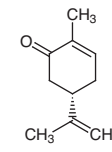
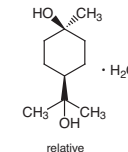
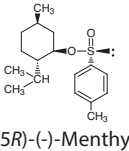
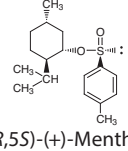
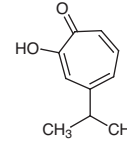
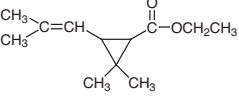
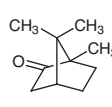
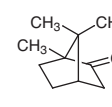
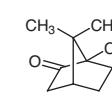
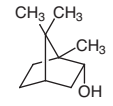
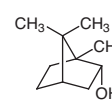
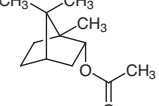
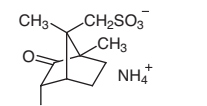
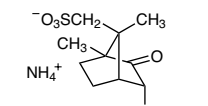
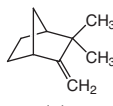
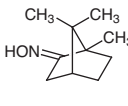
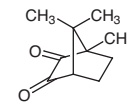
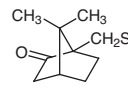
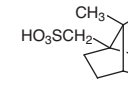
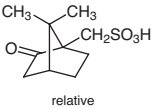
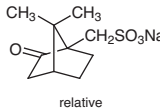
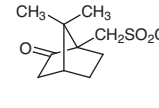
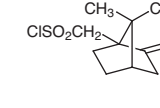
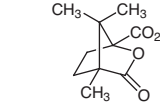
## 非環式モノテルペン

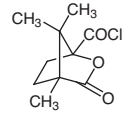
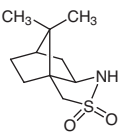
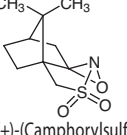
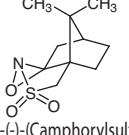
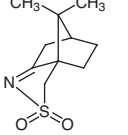
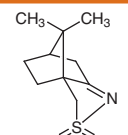
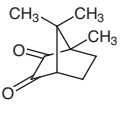
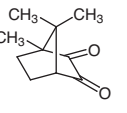
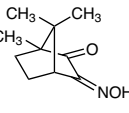
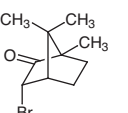
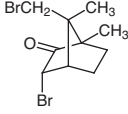
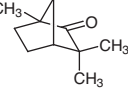
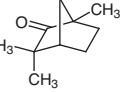
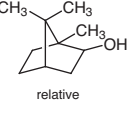
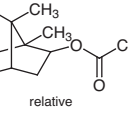
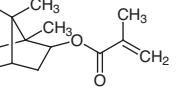
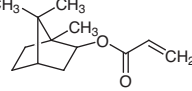
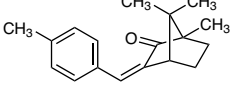
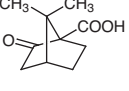
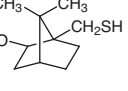
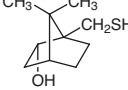
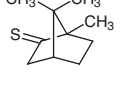
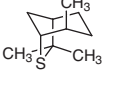
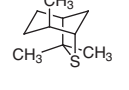
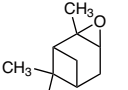
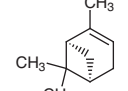
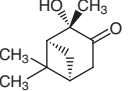
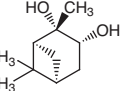
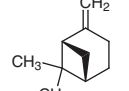
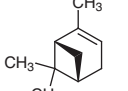
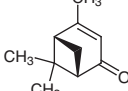
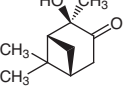
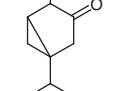
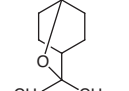
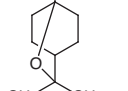
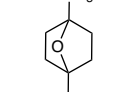
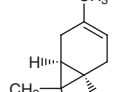
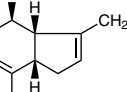
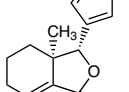
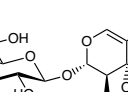
	<b>D0762</b> 25mL	<b>D5752</b> 25mL 100mL	<b>T0991</b> 25mL 500mL
	 Citral ( <i>cis</i> - and <i>trans</i> - mixture) CAS RN: 5392-40-5	 ( $\pm$ )-Dehydrolinalool CAS RN: 29171-20-8	 Tetrahydrolinalool CAS RN: 78-69-3
<b>D1212</b> 1mL	<b>C1454</b> 5mL 25mL	<b>C1708</b> 25mL	<b>M0235</b> 25mL 500mL
 2,6-Dimethyloctane CAS RN: 2051-30-1	 (-)-Citronellal CAS RN: 5949-05-3	 Citronellic Acid CAS RN: 502-47-6	 Myrcene (stabilized with BHT) CAS RN: 123-35-3
	<b>C0370</b> 25mL 100mL 500mL		
	 $\beta$ -Citronellol CAS RN: 106-22-9		
<b>N0077</b> 25mL 500mL	<b>C1466</b> 25mL	<b>C3619</b> 5mL 25mL	<b>D1442</b> 25mL 500mL
 Nerol CAS RN: 106-25-2	 (-)- $\beta$ -Citronellol (>95.0%) CAS RN: 7540-51-4	 (-)- $\beta$ -Citronellol (>98.0%) CAS RN: 7540-51-4	 3,7-Dimethyl-1-octanol CAS RN: 106-21-8
	<b>G0027</b> 25mL 100mL 500mL		
	 Geraniol CAS RN: 106-24-1		
<b>N0463</b> 25mL	<b>C0915</b> 25mL	<b>G0028</b> 25mL 100mL 500mL	<b>G0218</b> 25mL
 Neryl Acetate CAS RN: 141-12-8	 Citronellyl Acetate CAS RN: 150-84-5	 Geranyl Acetate CAS RN: 105-87-3	 Geranyl Formate CAS RN: 105-86-2
	<b>G0430</b> 5mL 25mL		
	 Geranyl Tiglate CAS RN: 7785-33-3		
<b>G0241</b> 25mL	<b>G0236</b> 25mL	<b>D1592</b> 25mL 500mL	<b>L0048</b> 25mL 500mL
 Geranyl Nitrile [mixture of ( <i>E</i> )- and ( <i>Z</i> )- isomers, (1:1)] CAS RN: 5146-66-7	 Geranylacetone [mixture of ( <i>E</i> )- and ( <i>Z</i> )- isomers, (3:2)] CAS RN: 689-67-8	 Dihydrolinalool CAS RN: 18479-51-1	 Linalool CAS RN: 78-70-6
	<b>L0049</b> 25mL 500mL		
	 Linalyl Acetate CAS RN: 115-95-7		

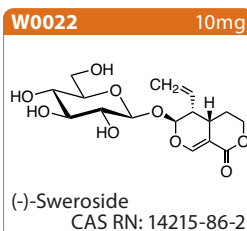
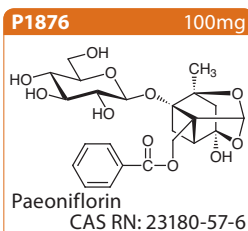
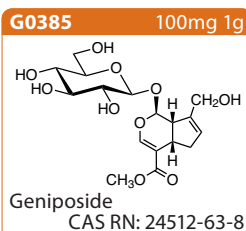


## 単環式モノテルペン

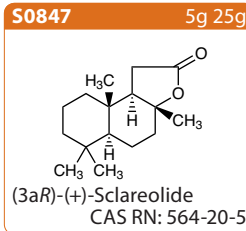
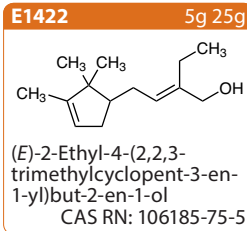
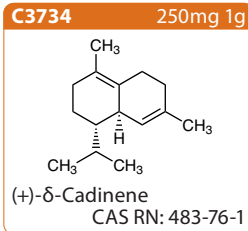
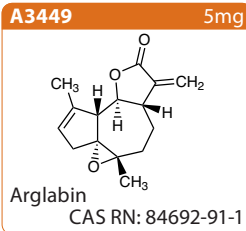
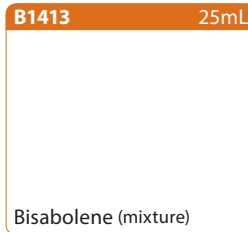
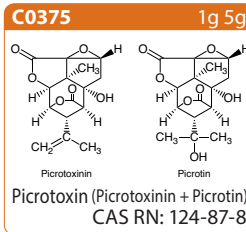
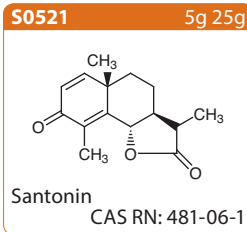
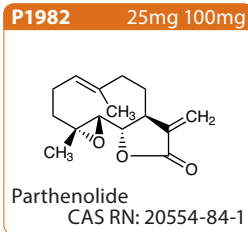
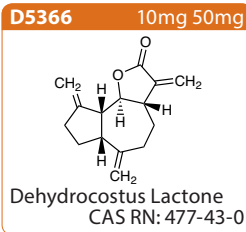
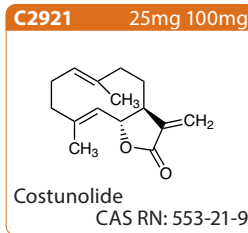
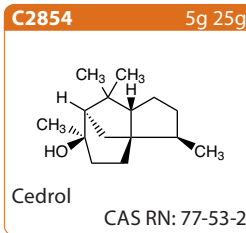
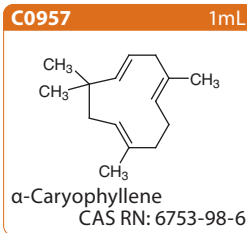
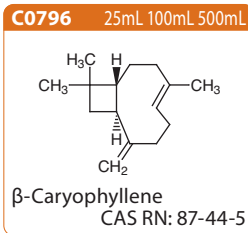
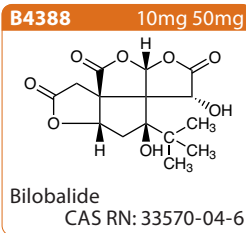
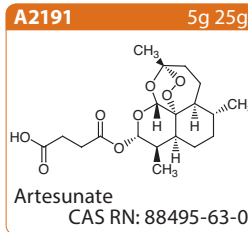
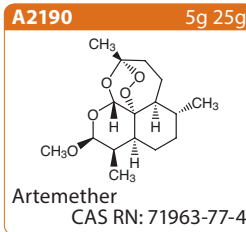
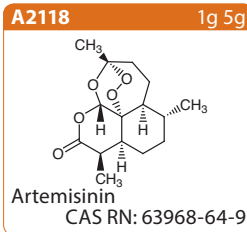
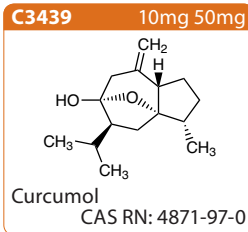
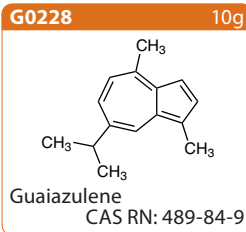
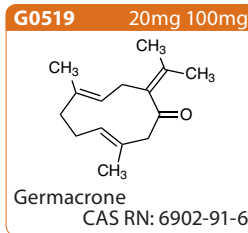
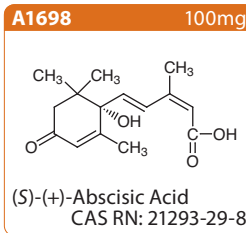
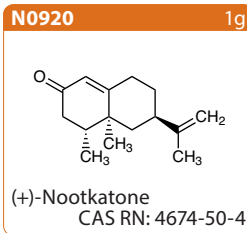
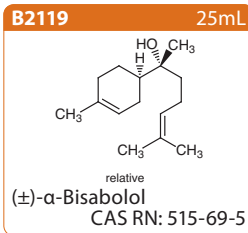
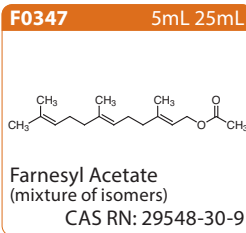
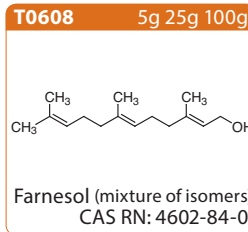
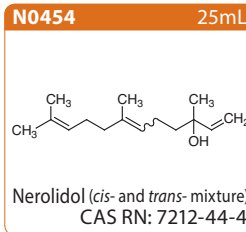
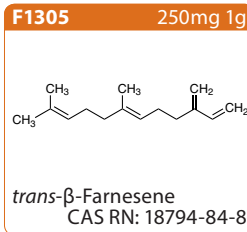


<p><b>N0626</b> 5mL 25mL</p>  <p>(+)-Neomenthol CAS RN: 2216-52-6</p>	<p><b>M0990</b> 5mL 25mL</p>  <p>(-)-Menthyl Chloroformate CAS RN: 14602-86-9</p>	<p><b>M1221</b> 5mL 25mL</p>  <p>(+)-Menthyl Chloroformate CAS RN: 7635-54-3</p>	<p><b>M0573</b> 5g 25g</p>  <p>(-)-Menthoxycetic Acid CAS RN: 40248-63-3</p>	<p><b>M2631</b> 1mL 5mL</p>  <p>(+)-Menthyl Acetate CAS RN: 5157-89-1</p>
<p><b>M3399</b> 25g</p>  <p>(±)-Menthyl Acetate CAS RN: 89-48-5</p>	<p><b>A1107</b> 25mL</p>  <p>(-)-Menthyl Acetate CAS RN: 2623-23-6</p>	<p><b>E0796</b> 5g 25g</p>  <p>N-Ethyl-p-menthane-3-carboxamide CAS RN: 39711-79-0</p>	<p><b>I0790</b> 25g</p>  <p>(-)-Menthyl 2,2-Dihydroxyacetate CAS RN: 111969-64-3</p>	<p><b>I0889</b> 5g 25g</p>  <p>L-Menthyl L-Lactate CAS RN: 61597-98-6</p>
<p><b>M2482</b> 25g</p>  <p>(-)-Menthyl Succinate CAS RN: 77341-67-4</p>	<p><b>C0026</b> 25g 100g 500g</p>  <p>Carvacrol CAS RN: 499-75-2</p>	<p><b>C0703</b> 25mL 100mL 500mL</p>  <p>(R)-(-)-Carvone CAS RN: 6485-40-1</p>	<p><b>C0704</b> 25mL</p>  <p>(S)-(-)-Carvone CAS RN: 2244-16-8</p>	<p><b>T2344</b> 25g</p>  <p>Terpin Monohydrate CAS RN: 2451-01-6</p>
<p><b>M1044</b> 5g 25g</p>  <p>(1R,2S,5R)-(-)-Menthyl (S)-p-Toluenesulfinate CAS RN: 1517-82-4</p>	<p><b>M1066</b> 1g 5g</p>  <p>(1S,2R,5S)-(+)-Menthyl (R)-p-Toluenesulfinate CAS RN: 91796-57-5</p>	<p><b>H0142</b> 1g 5g</p>  <p>Hinokitiol CAS RN: 499-44-5</p>	<p><b>D2112</b> 25g 100g</p>  <p>Ethyl Chrysanthemate CAS RN: 97-41-6</p>	
<p><b>二環式モノテルペン</b></p>				
		<p><b>C0010</b> 25g 500g</p>  <p>(+)-Camphor CAS RN: 464-49-3</p>	<p><b>C1251</b> 5g</p>  <p>(-)-Camphor CAS RN: 464-48-2</p>	<p><b>C0011</b> 25g 500g</p>  <p>(±)-Camphor CAS RN: 76-22-2</p>
<p><b>B1012</b> 25g 500g</p>  <p>(-)-Borneol CAS RN: 464-45-9</p>	<p><b>B0525</b> 25g 500g</p>  <p>Borneol (contains ca. 20% Isoborneol) CAS RN: 507-70-0</p>	<p><b>B0526</b> 25mL</p>  <p>Borneyl Acetate (contains ca. 20% Isoborneyl Acetate) CAS RN: 5655-61-8</p>	<p><b>B1125</b> 5g 25g</p>  <p>(+)-3-Bromocamphor-8-sulfonic Acid Ammonium Salt CAS RN: 14575-84-9</p>	<p><b>B4412</b> 1g 5g</p>  <p>(-)-3-Bromocamphor-8-sulfonic Acid Ammonium Salt CAS RN: 55870-50-3</p>
<p><b>C0009</b> 25g 100g</p>  <p>(±)-Camphene (contains ca. 20% Tricyclene) CAS RN: 79-92-5</p>	<p><b>C0013</b> 1g 5g 25g</p>  <p>(1R)-Camphor Oxime CAS RN: 2792-42-9</p>	<p><b>C0014</b> 5g 25g</p>  <p>(±)-Camphorquinone CAS RN: 10373-78-1</p>	<p><b>C0015</b> 25g 100g 500g</p>  <p>(+)-10-Camphorsulfonic Acid CAS RN: 3144-16-9</p>	<p><b>C0972</b> 25g 100g 500g</p>  <p>(-)-10-Camphorsulfonic Acid CAS RN: 35963-20-3</p>
<p><b>C0016</b> 25g 100g 500g</p>  <p>(±)-10-Camphorsulfonic Acid CAS RN: 5872-08-2</p>	<p><b>C0017</b> 25g</p>  <p>Sodium (±)-10-Camphorsulfonate CAS RN: 34850-66-3</p>	<p><b>C0998</b> 5g 25g</p>  <p>(+)-10-Camphorsulfonyl Chloride CAS RN: 21286-54-4</p>	<p><b>C1308</b> 5g 25g</p>  <p>(-)-10-Camphorsulfonyl Chloride CAS RN: 39262-22-1</p>	<p><b>C1021</b> 1g 5g</p>  <p>(-)-Camphanic Acid CAS RN: 13429-83-9</p>

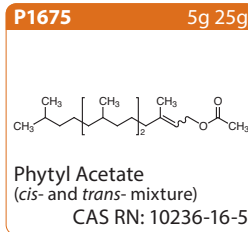
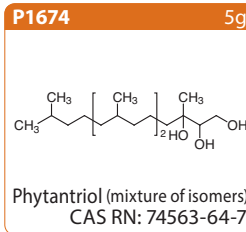
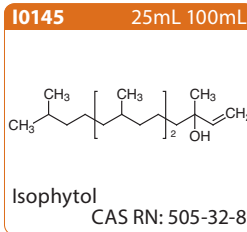
<p><b>C1022</b> 1g 5g 25g</p>  <p>(-)-Camphanic Chloride CAS RN: 39637-74-6</p>	<p><b>C1325</b> 1g 5g</p>  <p>(-)-10,2-Camphorsultam CAS RN: 94594-90-8</p>	<p><b>C1326</b> 1g 5g</p>  <p>(2R,8aS)-(+)-(Camphorylsulfonyl)-oxaziridine CAS RN: 104322-63-6</p>	<p><b>C1327</b> 1g 5g</p>  <p>(2S,8aR)-(-)-(Camphorylsulfonyl)-oxaziridine CAS RN: 104372-31-8</p>	<p><b>C1391</b> 5g</p>  <p>(+)-10-Camphorsulfonimine CAS RN: 107869-45-4</p>
<p><b>C1393</b> 5g</p>  <p>(-)-10-Camphorsulfonimine CAS RN: 60886-80-8</p>	<p><b>C1482</b> 1g 5g</p>  <p>(1R)-(-)-Camphorquinone CAS RN: 10334-26-6</p>	<p><b>C1660</b> 1g 5g</p>  <p>(1S)-(+)-Camphorquinone CAS RN: 2767-84-2</p>	<p><b>C1661</b> 1g</p>  <p><i>anti</i>-(1R)-(+)-Camphorquinone 3-Oxime CAS RN: 31571-14-9</p>	<p><b>B0567</b> 25g</p>  <p>(+)-3-Bromocamphor CAS RN: 10293-06-8</p>
<p><b>D2715</b> 5g 25g</p>  <p>(+)-3,9-Dibromocamphor CAS RN: 10293-10-4</p>	<p><b>F0163</b> 25mL</p>  <p>(+)-Fenchone CAS RN: 4695-62-9</p>	<p><b>F0164</b> 25mL 500mL</p>  <p>(-)-Fenchone CAS RN: 7787-20-4</p>	<p><b>I0275</b> 25g 500g</p>  <p>(±)-Isoborneol CAS RN: 124-76-5</p>	<p><b>I0306</b> 25mL 500mL</p>  <p>Isobornyl Acetate CAS RN: 125-12-2</p>
<p><b>I0617</b> 25g 500g</p>  <p>relative Isobornyl Methacrylate (stabilized with MEHQ) CAS RN: 7534-94-3</p>	<p><b>I0638</b> 25g 500g</p>  <p>relative Isobornyl Acrylate (stabilized with MEHQ) CAS RN: 5888-33-5</p>	<p><b>M3357</b> 25g 200g</p>  <p>3-(4-Methylbenzylidene)-camphor CAS RN: 36861-47-9</p>	<p><b>K0028</b> 1g 5g</p>  <p>(S)-(+)-Ketopinic Acid CAS RN: 40724-67-2</p>	<p><b>M1070</b> 1g</p>  <p>(1S)-(-)-10-Mercaptoisoborneol CAS RN: 71242-58-5</p>
<p><b>M1341</b> 100mg</p>  <p>(1S)-(-)-10-Mercaptoisoborneol CAS RN: 71242-59-6</p>	<p><b>T1863</b> 1g 5g</p>  <p>(1R)-(-)-Thiocamphor CAS RN: 53402-10-1</p>	<p><b>T2578</b> 1g 5g</p>  <p>(1R,4R,5R)-4,7,7-Trimethyl-6-thiabicyclo[3.2.1]octane CAS RN: 5718-75-2</p>	<p><b>T2579</b> 1g 5g</p>  <p>(1S,4S,5S)-4,7,7-Trimethyl-6-thiabicyclo[3.2.1]octane CAS RN: 1208985-45-8</p>	<p><b>P1362</b> 25mL 250mL</p>  <p>α-Pinene Oxide CAS RN: 1686-14-2</p>
<p><b>P1099</b> 25mL 500mL</p>  <p>(1R)-(+)-α-Pinene CAS RN: 7785-70-8</p>	<p><b>H0863</b> 1g 5g</p>  <p>(1S,2S,5S)-(-)-2-Hydroxy-3-pinane CAS RN: 1845-25-6</p>	<p><b>P1934</b> 5g 25g</p>  <p>(1S,2S,3R,5S)-(+)-2,3-Pinane diol CAS RN: 18680-27-8</p>	<p><b>P0441</b> 25mL 500mL</p>  <p>(-)-β-Pinene CAS RN: 18172-67-3</p>	<p><b>P0440</b> 25mL 500mL</p>  <p>(1S)-(-)-α-Pinene CAS RN: 7785-26-4</p>
<p><b>V0072</b> 25g</p>  <p>(-)-Verbenone CAS RN: 1196-01-6</p>	<p><b>H0862</b> 1g 5g</p>  <p>(1R,2R,5R)-(+)-2-Hydroxy-3-pinane CAS RN: 24047-72-1</p>	<p><b>T0989</b> 5mL 25mL</p>  <p>Thujone (α- and β- mixture) CAS RN: 1125-12-8</p>	<p><b>C0542</b> 25mL</p>  <p>1,8-Cineole (&gt;99.0%) CAS RN: 470-82-6</p>	<p><b>C0934</b> 25mL 100mL 500mL</p>  <p>1,8-Cineole (&gt;98.0%) CAS RN: 470-82-6</p>
<p><b>C3652</b> 25g 100g</p>  <p>1,4-Cineole CAS RN: 470-67-7</p>	<p><b>C0047</b> 25mL 500mL</p>  <p>(+)-3-Carene CAS RN: 498-15-7</p>	<p><b>G0458</b> 25mg 100mg</p>  <p>Genipin CAS RN: 6902-77-8</p>	<p><b>F1187</b> 10mg 50mg</p>  <p>Fraxinellone CAS RN: 28808-62-0</p>	<p><b>S0897</b> 25mg</p>  <p>Swertiamarin CAS RN: 17388-39-5</p>

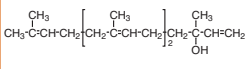
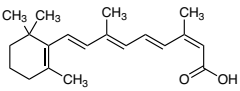
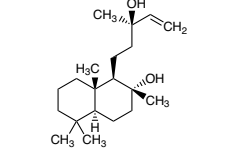
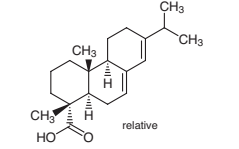
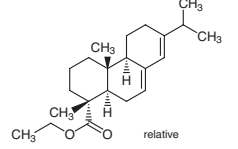
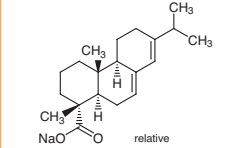
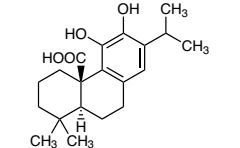
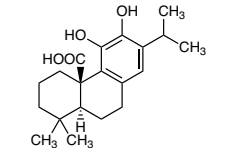
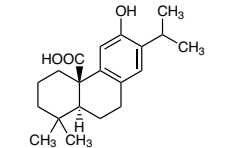
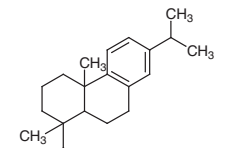
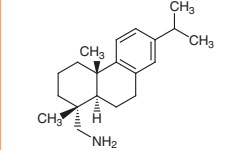
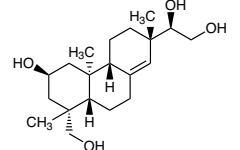
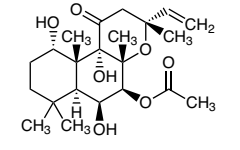
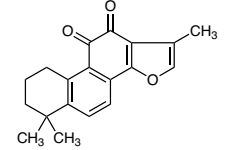
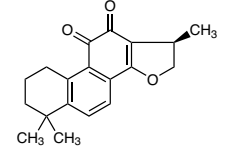
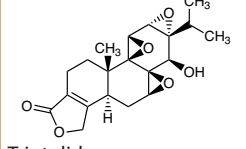
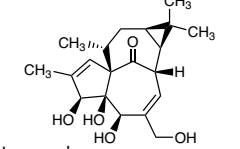
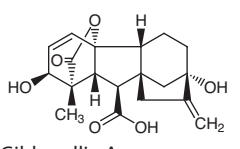
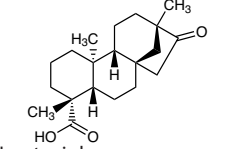
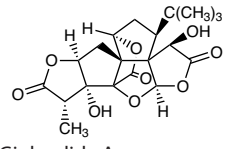
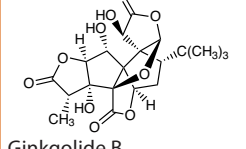
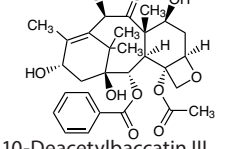
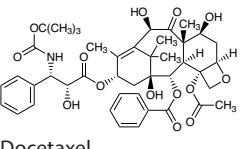
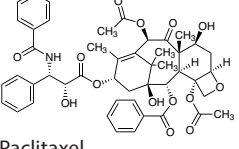
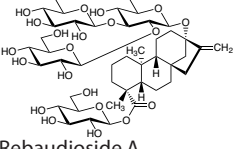
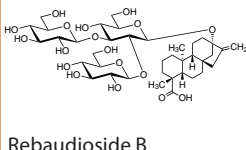
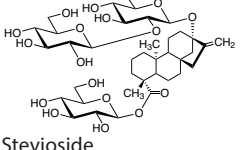
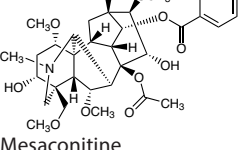
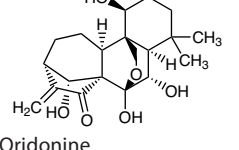
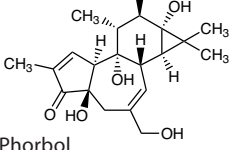
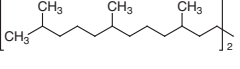
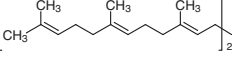
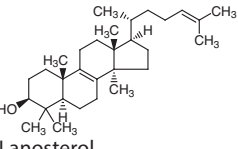
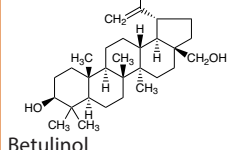
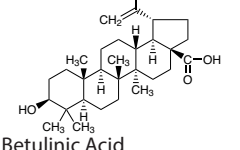
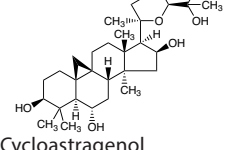
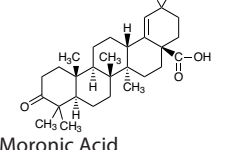
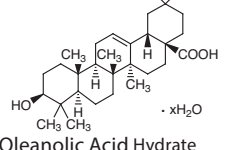


## セスキテルペン

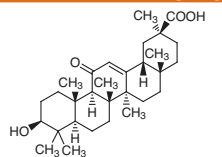
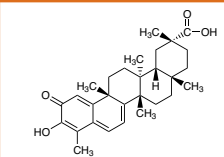
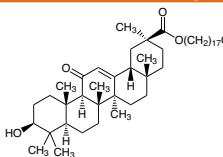
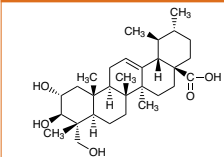
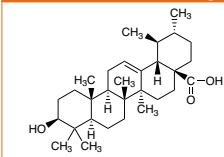
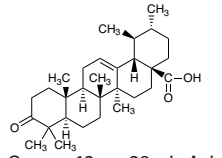
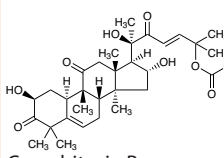
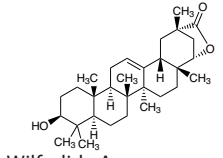
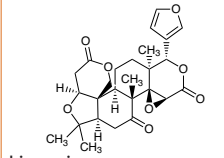
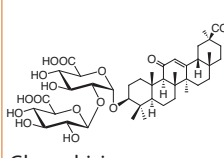
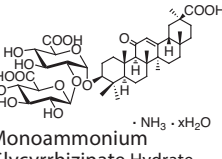
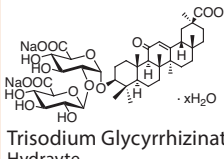
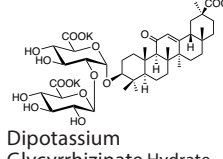
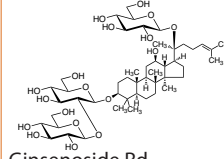
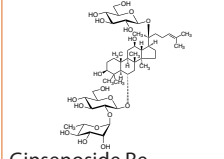
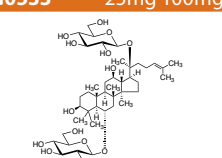
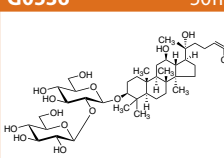
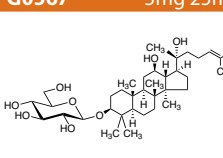
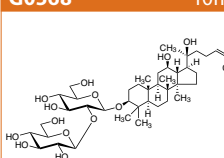
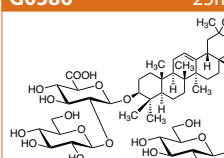
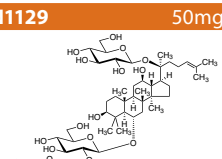
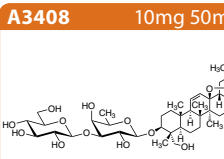
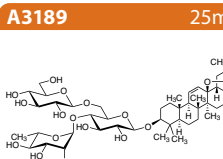
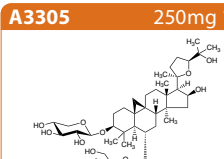
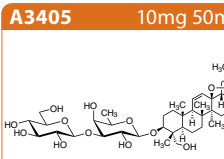
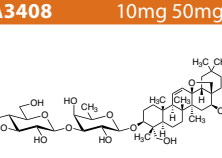
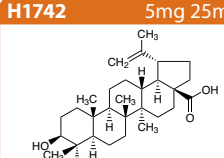
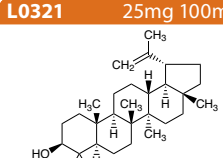
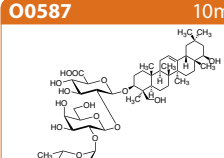
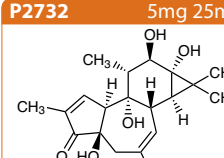
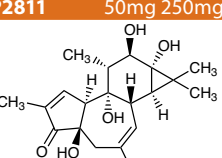
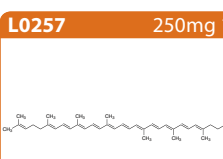


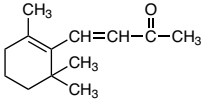
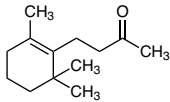
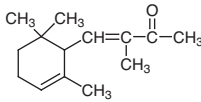
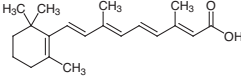
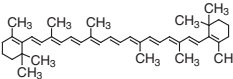
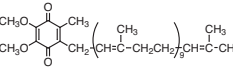
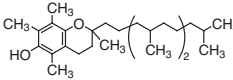
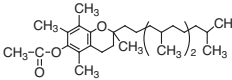
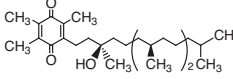
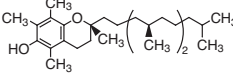
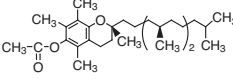
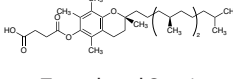
## ジテルペン



<p><b>G0221</b> 25mL</p>  <p>Geranyl-linalool (mixture of isomers) CAS RN: 68931-30-6</p>	<p><b>R0088</b> 100mg 1g</p>  <p>13-cis-Retinoic Acid CAS RN: 4759-48-2</p>	<p><b>S0916</b> 1g 5g</p>  <p>Sclareol CAS RN: 515-03-7</p>	<p><b>A0001</b> 25g 500g</p>  <p>Abietic Acid CAS RN: 514-10-3</p>	<p><b>A0002</b> 25g</p>  <p>Ethyl Abietate CAS RN: 631-71-0</p>
<p><b>A0651</b> 5g 25g</p>  <p>Sodium Abietate CAS RN: 14351-66-7</p>	<p><b>C2488</b> 20mg 100mg</p>  <p>Carnosic Acid (Synthetic) CAS RN: 3650-09-7</p>	<p><b>C3477</b> 20mg 100mg</p>  <p>Carnosic Acid CAS RN: 3650-09-7</p>	<p><b>P1933</b> 100mg</p>  <p>Pisiferic Acid CAS RN: 67494-15-9</p>	<p><b>D1180</b> 25g 500g</p>  <p>Dehydroabietylamine</p>
<p><b>D1588</b> 5g 25g</p>  <p>(+)-Dehydroabietylamine CAS RN: 1446-61-3</p>	<p><b>K0059</b> 25mg 100mg</p>  <p>Kirenol CAS RN: 52659-56-0</p>	<p><b>F0855</b> 10mg 50mg</p>  <p>Forskolol CAS RN: 66575-29-9</p>	<p><b>T2987</b> 10mg 50mg</p>  <p>Tanshinone IIA CAS RN: 568-72-9</p>	<p><b>C3363</b> 25mg 100mg</p>  <p>Cryptotanshinone CAS RN: 35825-57-1</p>
<p><b>T2899</b> 10mg</p>  <p>Triptolide CAS RN: 38748-32-2</p>	<p><b>I1112</b> 10mg 50mg</p>  <p>Ingenol CAS RN: 30220-46-3</p>	<p><b>G0029</b> 100mg 1g 5g</p>  <p>Gibberellin A<sub>3</sub> CAS RN: 77-06-5</p>	<p><b>I1069</b> 100mg 500mg</p>  <p>Isosteviol CAS RN: 27975-19-5</p>	<p><b>G0521</b> 10mg 50mg</p>  <p>Ginkgolide A CAS RN: 15291-75-5</p>
<p><b>G0553</b> 25mg 100mg</p>  <p>Ginkgolide B CAS RN: 15291-77-7</p>	<p><b>D4148</b> 100mg 500mg</p>  <p>10-Deacetylbaicatin III CAS RN: 32981-86-5</p>	<p><b>D4102</b> 100mg 1g</p>  <p>Docetaxel CAS RN: 114977-28-5</p>	<p><b>P1632</b> 100mg</p>  <p>Paclitaxel CAS RN: 33069-62-4</p>	<p><b>R0095</b> 5g 25g</p>  <p>Rebaudioside A CAS RN: 58543-16-1</p>
<p><b>R0248</b> 25mg</p>  <p>Rebaudioside B CAS RN: 58543-17-2</p>	<p><b>S0594</b> 25g</p>  <p>Stevioside CAS RN: 57817-89-7</p>	<p><b>M3404</b> 20mg</p>  <p>Mesaconitine CAS RN: 2752-64-9</p>	<p><b>O0387</b> 50mg</p>  <p>Oridonine CAS RN: 28957-04-2</p>	<p><b>P2732</b> 5mg 25mg</p>  <p>Phorbol CAS RN: 17673-25-5</p>
<p><b>トリテルペン</b></p>				
<p><b>H0096</b> 25mL 100mL 500mL</p>  <p>Squalane CAS RN: 111-01-3</p>		<p><b>H0097</b> 25mL 100mL 500mL</p>  <p>Squalene CAS RN: 111-02-4</p>		<p><b>C0427</b> 25g</p>  <p>Lanosterol CAS RN: 79-63-0</p>
<p><b>B0803</b> 100mg</p>  <p>Betulinol CAS RN: 473-98-3</p>	<p><b>B2836</b> 100mg 1g</p>  <p>Betulinic Acid CAS RN: 472-15-1</p>	<p><b>C3469</b> 25mg 100mg</p>  <p>Cycloastragenol CAS RN: 78574-94-4</p>	<p><b>M2610</b> 5mg 25mg</p>  <p>Moronic Acid CAS RN: 6713-27-5</p>	<p><b>O0317</b> 5g 25g</p>  <p>Oleanolic Acid Hydrate CAS RN: 508-02-1</p>



<p><b>G0149</b> 1g 25g</p>  <p>Glycyrrhetic Acid CAS RN: 471-53-4</p>	<p><b>C2737</b> 25mg</p>  <p>Celastrol CAS RN: 34157-83-0</p>	<p><b>S0988</b> 5g 25g</p>  <p>Stearyl Glycyrrhetinate CAS RN: 13832-70-7</p>	<p><b>A2475</b> 200mg</p>  <p>Asiatic Acid CAS RN: 464-92-6</p>	<p><b>U0065</b> 100mg 1g</p>  <p>Ursolic Acid CAS RN: 77-52-1</p>
<p><b>O0508</b> 100mg</p>  <p>3-Oxours-12-en-28-oic Acid CAS RN: 6246-46-4</p>	<p><b>C3442</b> 5mg 25mg</p>  <p>Cucurbitacin B CAS RN: 6199-67-3</p>	<p><b>W0011</b> 5mg 25mg</p>  <p>Wilforlide A CAS RN: 84104-71-2</p>	<p><b>L0258</b> 100mg 1g</p>  <p>Limonin CAS RN: 1180-71-8</p>	<p><b>G0150</b> 1g 25g</p>  <p>Glycyrrhizin CAS RN: 1405-86-3</p>
<p><b>G0151</b> 1g 25g</p>  <p>Monoammonium Glycyrrhizinate Hydrate CAS RN: 53956-04-0</p>	<p><b>G0217</b> 25g</p>  <p>Trisodium Glycyrrhizinate Hydrate CAS RN: 71277-78-6</p>	<p><b>G0270</b> 25g</p>  <p>Dipotassium Glycyrrhizinate Hydrate CAS RN: 68797-35-3</p>	<p><b>G0550</b> 25mg 100mg</p>  <p>Ginsenoside Rd CAS RN: 52705-93-8</p>	<p><b>G0551</b> 50mg 250mg</p>  <p>Ginsenoside Re CAS RN: 52286-59-6</p>
<p><b>G0533</b> 25mg 100mg</p>  <p>Ginsenoside Rg1 CAS RN: 22427-39-0</p>	<p><b>G0536</b> 50mg</p>  <p>20(R)-Ginsenoside Rg3 CAS RN: 38243-03-7</p>	<p><b>G0567</b> 5mg 25mg</p>  <p>20(R)-Ginsenoside Rh2 CAS RN: 112246-15-8</p>	<p><b>G0568</b> 10mg</p>  <p>20(S)-Ginsenoside Rg3 CAS RN: 14197-60-5</p>	<p><b>G0586</b> 25mg</p>  <p>Ginsenoside Ro CAS RN: 34367-04-9</p>
<p><b>N1129</b> 50mg</p>  <p>Notoginsenoside R1 CAS RN: 80418-24-2</p>	<p><b>A3408</b> 10mg 50mg</p>  <p>Saikosaponin A CAS RN: 20736-09-8</p>	<p><b>A3189</b> 25mg</p>  <p>Saikosaponin C CAS RN: 20736-08-7</p>	<p><b>A3305</b> 250mg 1g</p>  <p>Astragaloside IV CAS RN: 84687-43-4</p>	<p><b>A3405</b> 10mg 50mg</p>  <p>Saikosaponin D CAS RN: 20874-52-6</p>
<p><b>A3408</b> 10mg 50mg</p>  <p>Saikosaponin A CAS RN: 20736-09-8</p>	<p><b>H1742</b> 5mg 25mg</p>  <p>23-Hydroxybetulinic Acid CAS RN: 85999-40-2</p>	<p><b>L0321</b> 25mg 100mg</p>  <p>Lupeol CAS RN: 545-47-1</p>	<p><b>O0587</b> 10mg</p>  <p>Soyasaponin I CAS RN: 51330-27-9</p>	<p><b>P2732</b> 5mg 25mg</p>  <p>Phorbol CAS RN: 17673-25-5</p>
<p><b>P2811</b> 50mg 250mg</p>  <p>Panaxadiol CAS RN: 19666-76-3</p>	<p><b>その他のテルペン</b></p>			
<p><b>L0257</b> 250mg 1g</p>  <p>Lycopene CAS RN: 502-65-8</p>				

<p><b>I0077</b> 25mL 100mL 500mL</p>  <p><b>β-Ionone</b> CAS RN: 14901-07-6</p>	<p><b>D5751</b> 25g 100g</p>  <p><b>Dihydro-β-ionone</b> CAS RN: 17283-81-7</p>	<p><b>M0647</b> 25mL</p>  <p><b>α-iso-Methylionone</b> CAS RN: 127-51-5</p>	<p><b>M0363</b> 25mL</p> <p><b>Methylionone</b> (mixture of α- and β-, predominantly α-n-isomer) CAS RN: 7779-30-8</p>	<p><b>R0064</b> 1g 5g</p>  <p><b>Retinoic Acid</b> CAS RN: 302-79-4</p>
<p><b>C0560</b> 1g 5g</p>  <p><b>β-Carotene</b> CAS RN: 7235-40-7</p>	<p><b>C1971</b> 100mg 1g</p>  <p><b>Coenzyme Q<sub>10</sub></b> CAS RN: 303-98-0</p>	<p><b>T0251</b> 25g 250g</p>  <p><b>DL-α-Tocopherol</b> CAS RN: 10191-41-0</p>	<p><b>T0252</b> 25g 100g 500g</p>  <p><b>DL-α-Tocopherol Acetate</b> CAS RN: 7695-91-2</p>	<p><b>T2283</b> 500mg</p>  <p><b>D-α-Tocopherylquinone</b> CAS RN: 7559-04-8</p>
<p><b>T2309</b> 25g</p>  <p><b>D-α-Tocopherol</b> CAS RN: 59-02-9</p>	<p><b>T2322</b> 25g</p>  <p><b>D-α-Tocopherol Acetate</b> CAS RN: 58-95-7</p>	<p><b>T2628</b> 5g 25g</p>  <p><b>D-α-Tocopherol Succinate</b> CAS RN: 4345-03-3</p>	<p><b>C0781</b> 25g</p> <p><b>Capsanthin</b> (=Paprika Extract) (Vegetable oil solution) CAS RN: 465-42-9</p>	<p><b>C1527</b> 25g</p> <p><b>Crocin</b> (Gardenia Fruits Extract) CAS RN: 42553-65-1</p>

## 東京化成工業株式会社

### 試薬製品について

■本社営業部 〒103-0001 東京都中央区日本橋小伝馬町 16-12 T-PLUS 日本橋小伝馬町8階  
Tel: 03-3668-0489 Fax: 03-3668-0520 E-mail: Sales-JP@TCIchemicals.com

■大阪営業部 〒541-0041 大阪府大阪市中央区北浜 1-1-21 第2中井ビル1階  
Tel: 06-6228-1155 Fax: 06-6228-1158 E-mail: osaka-s@TCIchemicals.com

### スケールアップ、受託サービス(合成・開発・製造)について

□化成品営業部 〒103-0001 東京都中央区日本橋小伝馬町 16-12 T-PLUS 日本橋小伝馬町8階  
Tel: 03-5651-5171 Fax: 03-5640-8021 E-mail: finechemicals@TCIchemicals.com

### 弊社製品取扱店

本誌掲載の化学品は試験・研究用のみ使用するものです。化学知識のある専門家以外の方のご使用はお避けください。品目や製品情報等、掲載内容の変更を予告なく行う場合があります。内容の一部または全部の無断転載・複製はご遠慮ください。