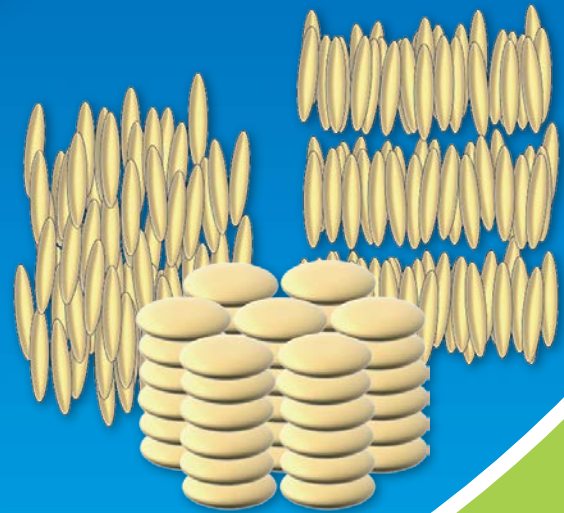
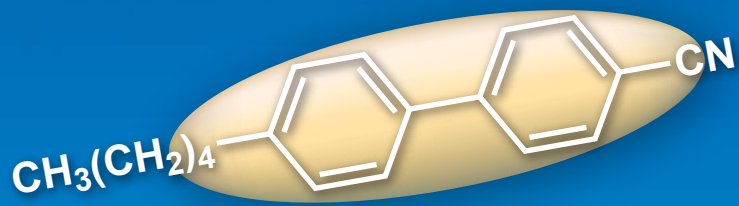


# Liquid Crystal Materials



Nematic & Smectic Liquid Crystals

Cholesteric Liquid Crystals

Discotic Liquid Crystals

# Liquid Crystal Materials

Liquid crystals are states (or compounds) having both fluidity like liquids and long range order like crystals. To be specific, liquid crystalline states involve an ordered molecular orientation but they partially or fully lack positional orders of gravity center in the arranged molecules compared to normal crystal states. Thermotropic and lyotropic liquid crystals are two main classes of liquid crystals. The former liquid crystalline phase appears by changing temperature, and the latter phase appears by changing solution concentration of amphiphilic compounds, etc.

Most thermotropic liquid crystalline molecules have either a calamitic or discotic molecular shape. Calamitic liquid crystals usually exhibit several mesophases: nematic, smectic, and cholesteric phases. Forming these liquid crystalline states enables these compounds to exhibit characteristic functions such as optical anisotropy and ferroelectricity. Besides calamitic and discotic liquid crystals, other liquid crystals with unique molecular shapes e.g. banana-shaped ones with bent-cores<sup>1,2)</sup> and shuttlecock-shaped fullerene derivatives<sup>3)</sup> have been investigated extensively.

The nematic phase is a state in which molecules are oriented along the direction of the molecular long axis but the molecular gravity centers are randomly located like an isotropic liquid (Figure 1(a)). A nematic phase usually appears at a higher temperature than the other mesophases when there are several possible ones. The TN (Twisted Nematic) mode<sup>4)</sup> of liquid crystal displays requires fast responding nematic liquid crystal molecules having large dielectric constant anisotropy, e.g. 5CB (4-Cyano-4'-pentyl-biphenyl).

The smectic phases show a positionally ordered molecular arrangement with organization along the molecular long axis as well as with layered organizations shown in Figure 1(b). These phases appear at the lower temperature range with lower fluidity than those of nematic phases. Smectic phases are diverse due to a distinct molecular arrangement in the layers and distinct orders of inter- and intra- layers.

The cholesteric phase shown in Figure 1(c) usually involves cholesteryl compounds. On the basis of chirality of the molecules, the phase demonstrates twisted molecular arrangements, resulting in helical structures with certain periodicity (pitch). The phase may be categorized into nematic phases and called a chiral nematic phase. An addition of chiral inducers into nematic liquid crystals also provides the cholesteric phase. Since the helical pitch is thermally responsive to changing reflective colors, they are applicable for liquid crystal thermometers.

The discotic phases, the state composed by disk-like molecules (Figure 1(d)), are divided into more specific ones such as discotic nematic and discotic columnar types according to the molecular arrangements. It is a relatively new liquid crystalline phase initially

found in 1977.<sup>5)</sup>

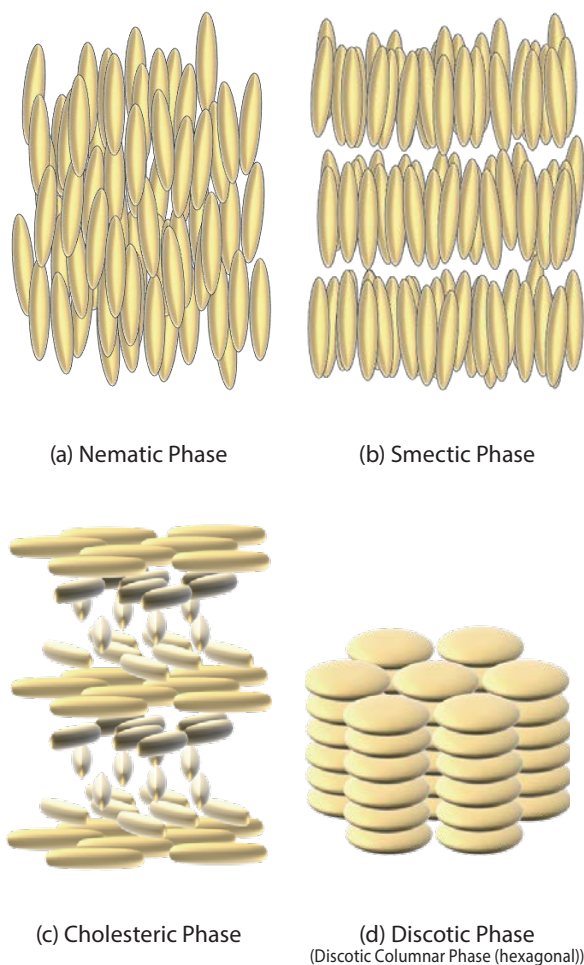


Figure 1. Illustration of typical liquid crystal phases

## ● Liquid Crystalline Phases with Complex 3D Structures

Some mesophases with complex 3D molecular arrangements also have been discovered. One representative example is the blue phase, which is expected to be a powerful candidate for fast response displays without an oriented film and a polarizer<sup>6,7)</sup> and to be photonic crystals for laser oscillations.<sup>8,9)</sup> Since the blue phases involve basic units, the so-called double-twist cylinders, all recognized phases, i.e., body centered cubic (Blue Phase I), simple cubic (Blue Phase II), and amorphous (Blue phase III) are optically isotropic. They are normally observed within a small temperature range (typically  $\sim 1$  °C) between cholesteric and isotropic phases. This fact has caused limitations on their application. In recent years, several research groups reported active examples e.g. extension of temperature range up to  $\sim 60$  °C by forming polymers in the blue phase (polymer-stabilized blue phase)<sup>10)</sup> and up to  $\sim 40$  °C by developing two biphenyl-linked compounds.<sup>11)</sup>

## ● Polymer Dispersed Liquid Crystals

Polymer dispersed liquid crystals (PDLC) are applied to “smart windows” which can switch the transparency of windows by turning voltage on and off. In the PDLC films, liquid crystal domains are dispersed into the polymer matrix. Turning the voltage on can make the film transparent, because the refractive index of the liquid crystal domains becomes almost similar to that of the polymer matrix with respect to incident light by making liquid crystalline molecules align with the electric field. On the other hand, turning the voltage off makes the film translucent, because the refractive index of the liquid crystal becomes different from that of the matrix by forming a random location of the liquid crystalline molecules. In addition to the smart windows, the PDLCs are also expected to be used as materials for reflective displays working with low power such as an electronic paper.

## ● Liquid Crystalline Semiconductors

There are many organic semiconductors having liquid crystallinity. Liquid crystalline semiconductors have provided much interest for enabling production of devices in a wet process at low cost, improvement of molecular orientation and carrier mobility utilizing their self-organizing ability in a post-process, and fabrication of flexible devices with high bending strength more than crystalline organic semiconductors. In addition to calamitic liquid crystalline semiconductors,<sup>12)</sup> discotic ones have been developed.<sup>13)</sup> The discotic liquid crystalline semiconductors demonstrate efficient carrier mobility along with the columnar direction of the stacked molecules, therefore, they can be used as materials for organic photovoltaics (OPVs).<sup>14)</sup>

## ● Applications of Liquid Crystal Media for Providing Functions

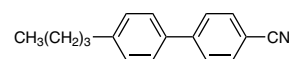
Liquid crystals are also utilized as reaction media for providing some specific functions to other materials. A few decades ago, acetylene was polymerized in liquid crystal solvents to control the orientation of the polymer-aggregated fibril structure enhancing electrical conductivity to the oriented direction.<sup>15)</sup> Other examples for such studies are synthesis of mesoporous silica in the reaction media composed of lyotropic liquid crystals<sup>16)</sup> and realization of oriented carbon nanotubes in liquid crystal media.<sup>17)</sup>

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Nematic / Smectic  
Liquid CrystalsCyanobiphenyls &  
Analog

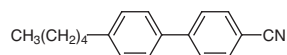
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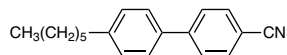
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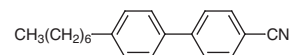
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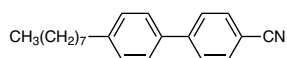
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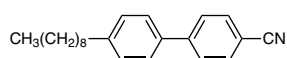
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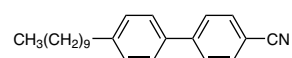
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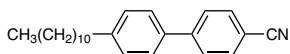
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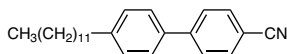
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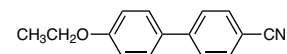
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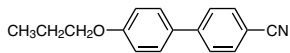
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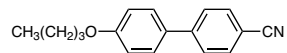
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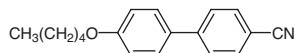
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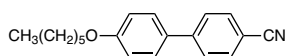
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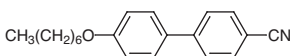
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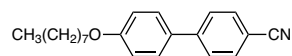
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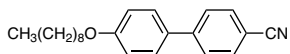
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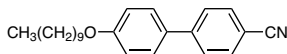
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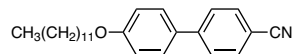
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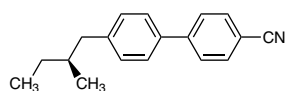
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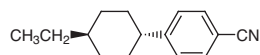
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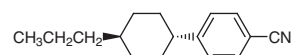
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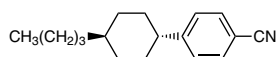
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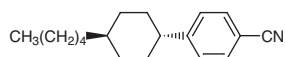
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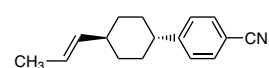
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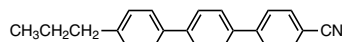
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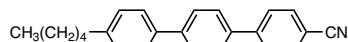
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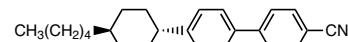
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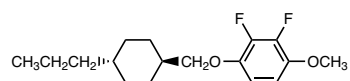
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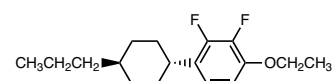
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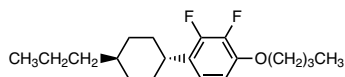
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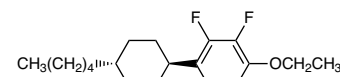
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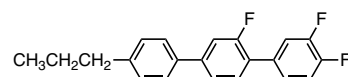
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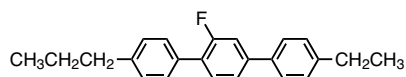
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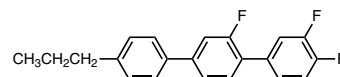
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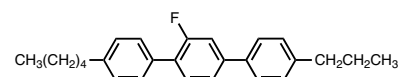
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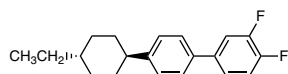
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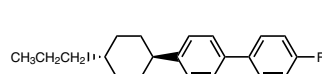
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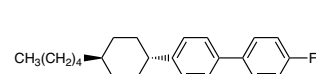
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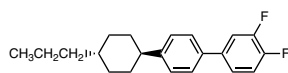
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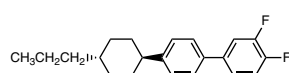
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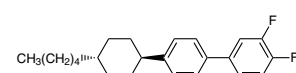
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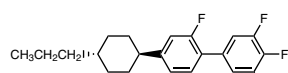
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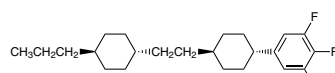
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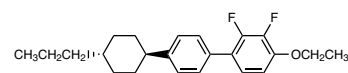
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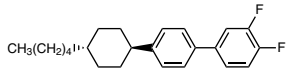
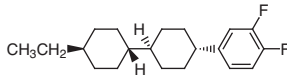
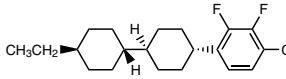
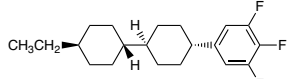
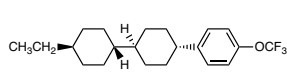
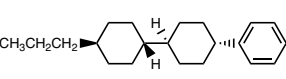
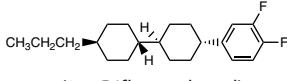
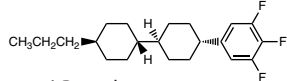
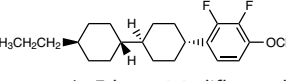
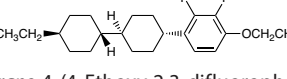
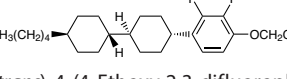
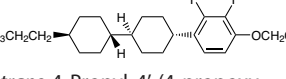
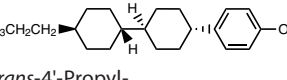
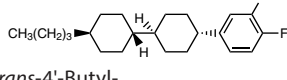
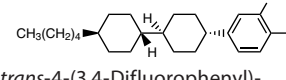
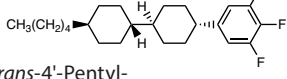
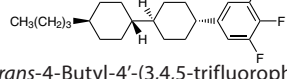
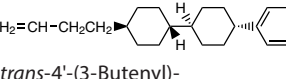
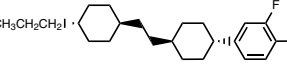
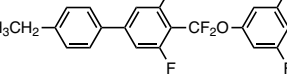
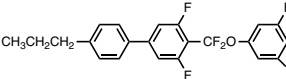
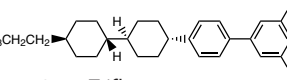
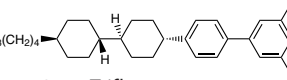
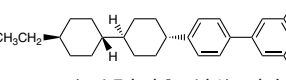
2',3,4,5-Tetrafluoro-4'-(*trans*-4-propylcyclohexyl)biphenyl  
CAS RN: 173837-35-9

T3466 1g 5g

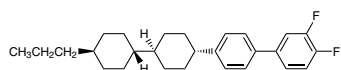
1,2,3-Trifluoro-5-[*trans*-4-[2-(*trans*-4-propylcyclohexyl)ethyl]cyclohexyl]benzene  
CAS RN: 131819-24-4

E1158 5g 25g

4-Ethoxy-2,3-difluoro-4'-(*trans*-4-propylcyclohexyl)biphenyl  
CAS RN: 189750-98-9

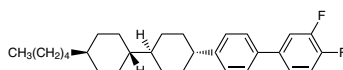
<p><b>D4534</b> 5g 25g</p>  <p>3,4-Difluoro-4'-(<i>trans</i>-4-pentylcyclohexyl)biphenyl CAS RN: 134412-17-2</p>	<p><b>D3856</b> 1g 5g</p>  <p><i>trans</i>-4-(3,4-Difluorophenyl)-<i>trans</i>-4'-ethylbicyclohexane CAS RN: 118164-50-4</p>	<p><b>D5127</b> 1g 5g</p>  <p><i>trans,trans</i>-4-(2,3-Difluoro-4-methylphenyl)-4'-ethylbicyclohexyl CAS RN: 174350-08-4</p>
<p><b>E1156</b> 5g 25g</p>  <p><i>trans,trans</i>-4'-Ethyl-4-(3,4,5-trifluorophenyl)bicyclohexyl CAS RN: 139215-80-8</p>	<p><b>E1165</b> 5g</p>  <p><i>trans,trans</i>-4'-Ethyl-4-(4-trifluoromethoxyphenyl)bicyclohexyl CAS RN: 135734-59-7</p>	<p><b>F1102</b> 1g 5g</p>  <p><i>trans,trans</i>-4-(4-Fluorophenyl)-4'-propylbicyclohexyl CAS RN: 82832-27-7</p>
<p><b>D4797</b> 1g 5g</p>  <p><i>trans,trans</i>-4-(3,4-Difluorophenyl)-4'-propylbicyclohexyl CAS RN: 82832-57-3</p>	<p><b>P2314</b> 5g 25g</p>  <p><i>trans,trans</i>-4'-Propyl-4-(3,4,5-trifluorophenyl)bicyclohexyl CAS RN: 131819-23-3</p>	<p><b>E1157</b> 1g 5g</p>  <p><i>trans,trans</i>-4-(4-Ethoxy-2,3-difluorophenyl)-4'-propylbicyclohexyl CAS RN: 123560-48-5</p>
<p><b>E1477</b> 1g</p>  <p><i>trans,trans</i>-4-(4-Ethoxy-2,3-difluorophenyl)-4'-ethyl-1,1'-bi(cyclohexyl) CAS RN: 253199-08-5</p>	<p><b>E1487</b> 1g 5g</p>  <p>(<i>trans,trans</i>)-4-(4-Ethoxy-2,3-difluorophenyl)-4'-pentyl-1,1'-bi(cyclohexane) CAS RN: 124728-81-0</p>	<p><b>D6019</b> 1g</p>  <p><i>trans,trans</i>-4-Propyl-4'-(4-propoxy-2,3-difluorophenyl)bicyclohexyl CAS RN: 473257-14-6</p>
<p><b>P2464</b> 1g</p>  <p><i>trans,trans</i>-4'-Propyl-4-(4-trifluoromethoxyphenyl)bicyclohexyl CAS RN: 133937-72-1</p>	<p><b>B4925</b> 5g 25g</p>  <p><i>trans,trans</i>-4'-Butyl-4-(3,4-difluorophenyl)bicyclohexyl CAS RN: 82832-58-4</p>	<p><b>D4798</b> 1g 5g</p>  <p><i>trans,trans</i>-4-(3,4-Difluorophenyl)-4'-pentylbicyclohexyl CAS RN: 118164-51-5</p>
<p><b>P2319</b> 5g</p>  <p><i>trans,trans</i>-4'-Pentyl-4-(3,4,5-trifluorophenyl)bicyclohexyl CAS RN: 137644-54-3</p>	<p><b>B6348</b> 1g 5g</p>  <p><i>trans,trans</i>-4-Butyl-4'-(3,4,5-trifluorophenyl)-1,1'-bi(cyclohexyl) CAS RN: 139420-31-8</p>	<p><b>B4916</b> 1g 5g</p>  <p><i>trans,trans</i>-4'-(3-Butenyl)-4-(3,4-difluorophenyl)bicyclohexyl CAS RN: 155266-68-5</p>
<p><b>D5128</b> 1g 5g</p>  <p>1,2-Difluoro-4-[<i>trans</i>-4-[2-(<i>trans</i>-4-propylcyclohexyl)ethyl]cyclohexyl]benzene CAS RN: 117943-37-0</p>	<p><b>D5129</b> 1g 5g</p>  <p>4-[Difluoro(3,4,5-trifluorophenoxy)methyl]-4'-ethyl-3,5-difluorobiphenyl CAS RN: 303186-19-8</p>	<p><b>D5130</b> 1g 5g</p>  <p>4-[Difluoro(3,4,5-trifluorophenoxy)methyl]-3,5-difluoro-4'-propylbiphenyl CAS RN: 303186-20-1</p>
<p><b>T3319</b> 1g 5g</p>  <p><i>trans,trans</i>-3,4,5-Trifluoro-4'-(4'-propylbicyclohexyl-4-yl)biphenyl CAS RN: 137529-41-0</p>	<p><b>T3482</b> 1g 5g</p>  <p><i>trans,trans</i>-3,4,5-Trifluoro-4'-(4'-pentylbicyclohexyl-4-yl)biphenyl CAS RN: 137529-43-2</p>	<p><b>T3483</b> 1g 5g</p>  <p>4'-[[<i>trans,trans</i>]-4'-Ethyl-[1,1'-bi(cyclohexan)]-4-yl]-3,4,5-trifluoro-1,1'-biphenyl CAS RN: 137529-40-9</p>

D5650 1g 5g



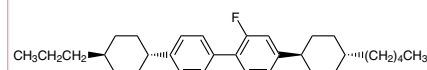
*trans,trans*-3,4-Difluoro-4'-(4'-propylbicyclohexyl-4-yl)biphenyl  
CAS RN: 119990-81-7

D5651 1g 5g



*trans,trans*-3,4-Difluoro-4'-(4'-pentylbicyclohexyl-4-yl)biphenyl  
CAS RN: 136609-96-6

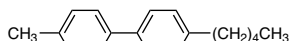
F1122 1g 5g



2-Fluoro-4-(*trans*-4-pentylcyclohexyl)-4'-(*trans*-4-propylcyclohexyl)biphenyl  
CAS RN: 106349-49-9

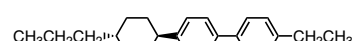
## Other Biphenyls & Analogs

M2885 1g 5g



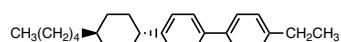
4'-Methyl-4-pentylbiphenyl  
CAS RN: 64835-63-8

E1162 5g 25g



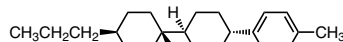
4-Ethyl-4'-(*trans*-4-propylcyclohexyl)biphenyl  
CAS RN: 84540-37-4

E1254 1g 5g



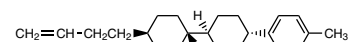
4-Ethyl-4'-(*trans*-4-pentylcyclohexyl)biphenyl  
CAS RN: 79709-85-6

P2404 1g 5g



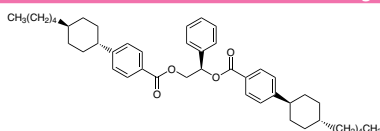
*trans,trans*-4'-(3-butyl)-4-(*p*-tolyl)bicyclohexyl  
CAS RN: 84656-75-7

B4915 1g 5g



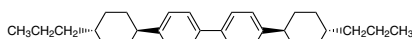
*trans,trans*-4'-(3-butenyl)-4-(*p*-tolyl)bicyclohexyl  
CAS RN: 129738-42-7

P2150 200mg 1g



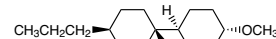
(*R*)-1-Phenyl-1,2-ethanediyl Bis[4-(*trans*-4-pentylcyclohexyl)benzoate]  
CAS RN: 154102-21-3

B5881 5g 25g



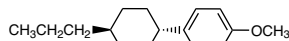
4,4'-Bis(*trans*-4-propylcyclohexyl)biphenyl  
CAS RN: 85600-56-2

M3140 5g



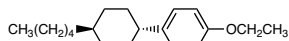
*trans,trans*-4-Methoxy-4'-propyl-1,1'-bicyclohexyl  
CAS RN: 97398-80-6

M3152 5g 25g



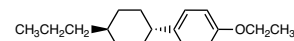
1-Methoxy-4-(*trans*-4-propylcyclohexyl)benzene  
CAS RN: 81936-32-5

E1367 5g 25g



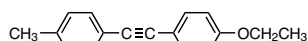
1-Ethoxy-4-(*trans*-4-pentylcyclohexyl)benzene  
CAS RN: 84540-32-9

E1369 5g 25g



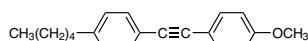
1-Ethoxy-4-(*trans*-4-propylcyclohexyl)benzene  
CAS RN: 80944-44-1

E1342 1g 5g



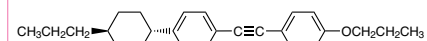
1-Ethoxy-4-[(*p*-tolylethynyl)benzene  
CAS RN: 116903-46-9

M3230 5g 25g



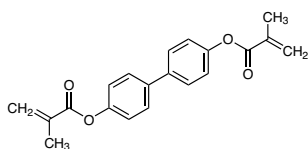
1-Methoxy-4-[[4-(*trans*-4-propylcyclohexyl)phenyl]ethynyl]benzene  
CAS RN: 39969-28-3

P2440 1g 5g



1-Propoxy-4-[[4-(*trans*-4-propylcyclohexyl)phenyl]ethynyl]benzene  
CAS RN: 116903-49-2

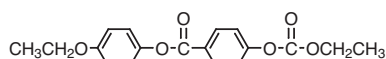
B5961 1g 5g



Biphenyl-4,4'-diyl Bis(2-methylacrylate)  
CAS RN: 13082-48-9

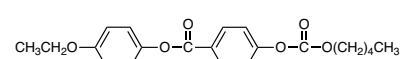
## Carbonates

E0257 1g



4-(4-Ethoxyphenoxy)phenyl Ethyl Carbonate  
CAS RN: 33926-25-9

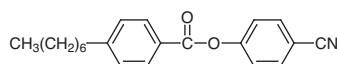
A0608 1g



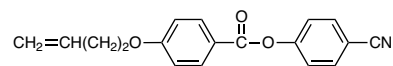
Amyl 4-(4-Ethoxyphenoxy)phenyl Carbonate  
CAS RN: 33926-46-4

## Phenyl Esters

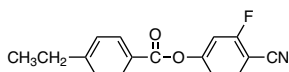
H0810 1g 5g

4-Cyanophenyl 4-Heptylbenzoate  
CAS RN: 38690-76-5

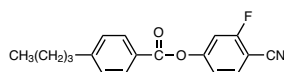
B1586 1g

4-Cyanophenyl 4-(3-Butenyloxy)benzoate  
CAS RN: 114482-57-4

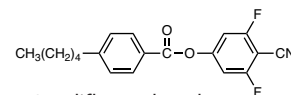
C3540 5g 25g

4-Cyano-3-fluorophenyl 4-Ethylbenzoate  
CAS RN: 86776-50-3

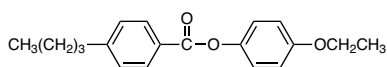
C3341 1g

4-Cyano-3-fluorophenyl 4-Butylbenzoate  
CAS RN: 86776-52-5

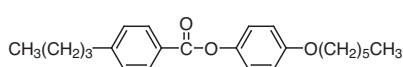
C3512 1g 5g

4-Cyano-3,5-difluorophenyl  
4-Pentylbenzoate  
CAS RN: 123843-69-6

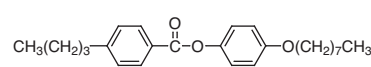
B0375 1g

4-Ethoxyphenyl 4-Butylbenzoate  
CAS RN: 62716-65-8

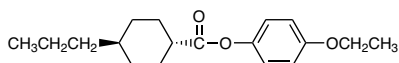
B1091 1g

4-(Hexyloxy)phenyl 4-Butylbenzoate  
CAS RN: 38454-28-3

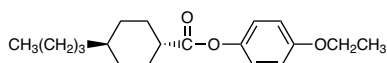
B1092 1g

4-n-Octyloxyphenyl 4-Butylbenzoate  
CAS RN: 42815-59-8

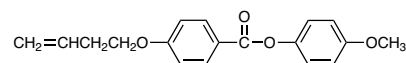
E1395 25g 100g

4-Ethoxyphenyl  
*trans*-4-Propylcyclohexanecarboxylate  
CAS RN: 67589-39-3

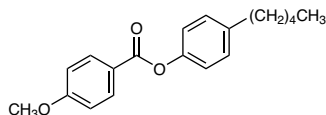
E1396 25g 100g

4-Ethoxyphenyl  
*trans*-4-Butylcyclohexanecarboxylate  
CAS RN: 67589-47-3

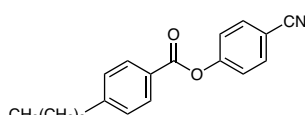
M2106 1g 5g

4-Methoxyphenyl 4-(3-Butenyloxy)benzoate  
CAS RN: 76487-56-4

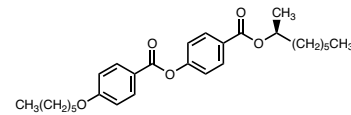
P2692 5g

4-Pentylphenyl 4-Methoxybenzoate  
CAS RN: 38444-13-2

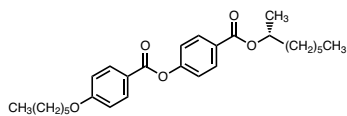
C3794 5g 25g

4-Cyanophenyl 4-Butylbenzoate  
CAS RN: 38690-77-6

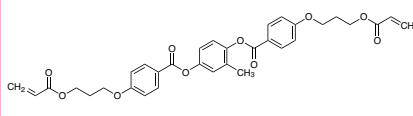
O0461 1g 5g

(S)-2-Octyl 4-[4-(Hexyloxy)benzoyloxy]-benzoate  
CAS RN: 87321-20-8

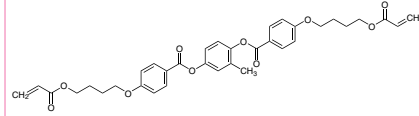
O0460 1g

(R)-2-Octyl 4-[4-(Hexyloxy)benzoyloxy]-benzoate  
CAS RN: 133676-09-2

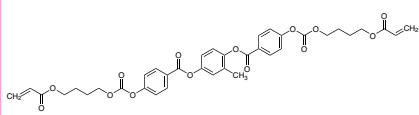
B5356 200mg 1g

1,4-Bis[4-(3-acryloyloxypropoxy)benzoyloxy]-  
2-methylbenzene  
CAS RN: 174063-87-7

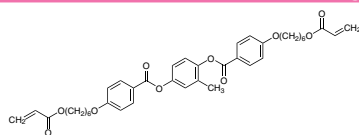
D5936 1g 5g

1,4-Di[4-(4-acryloyloxybutoxy)benzoyloxy]-  
2-methylbenzene  
CAS RN: 132900-75-5

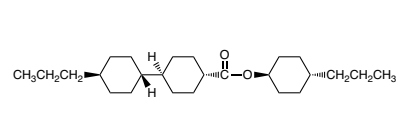
M3368 1g 5g 25g

2-Methyl-1,4-phenylene Bis[4-[[[4-(acryloyloxy)-  
butoxy]carbonyl]oxy]benzoate]  
CAS RN: 187585-64-4

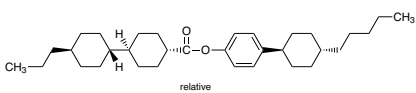
M3585 1g 5g

2-Methyl-1,4-phenylene Bis[4-[[[6-(acryloyloxy)-  
hexyl]oxy]benzoate]  
CAS RN: 125248-71-7

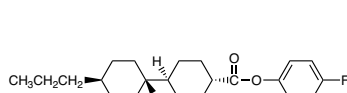
P2436 1g 5g

*trans*-4-Propylcyclohexyl  
*trans,trans*-4'-Propylbicyclohexyl-4-carboxylate  
CAS RN: 83242-83-5

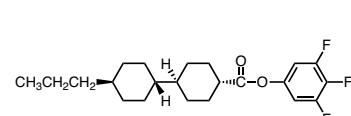
P2696 1g 5g

4-(*trans*-4-Pentylcyclohexyl)phenyl  
(*trans,trans*)-4'-Propyl-[1,1'-bi(cyclohexane)]-  
4-carboxylate  
CAS RN: 131790-57-3

F1312 5g 25g

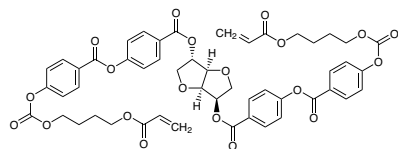
4-Fluorophenyl *trans,trans*-  
4'-Propyl[1,1'-bi(cyclohexyl)]-4-carboxylate  
CAS RN: 81701-13-5

T3756 5g 25g

3,4,5-Trifluorophenyl  
*trans,trans*-4'-Propylbicyclohexyl-4-carboxylate  
CAS RN: 132123-45-6



B6483 200mg 1g

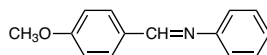


LC 756

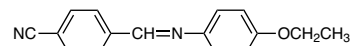
CAS RN: 223572-88-1

## Schiff Bases

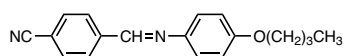
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N-(4-Methoxybenzylidene)aniline  
CAS RN: 836-41-9

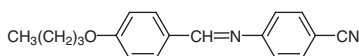
C0744 1g

4'-Cyanobenzylidene-4-ethoxyaniline  
CAS RN: 34128-02-4

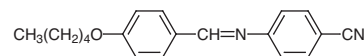
C0743 1g

4'-Cyanobenzylidene-4-butoxyaniline  
CAS RN: 55873-21-7

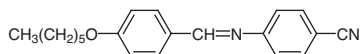
B0252 1g

4'-Butoxybenzylidene-4-cyanoaniline  
CAS RN: 36405-17-1

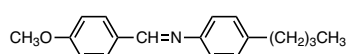
B0253 1g

4'-(Amyloxy)benzylidene-4-cyanoaniline  
CAS RN: 37075-25-5

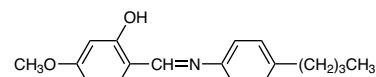
H0419 1g

4'-Hexyloxybenzylidene-4-cyanoaniline  
CAS RN: 35280-78-5

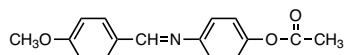
M0275 25g

N-(4-Methoxybenzylidene)-4-butylaniline  
CAS RN: 26227-73-6

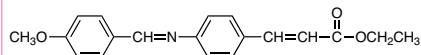
B0250 1g

N-(4-Methoxy-2-hydroxybenzylidene)-4-butylaniline  
CAS RN: 30633-94-4

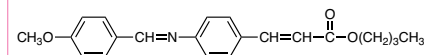
M0581 25g

N-(4-Methoxybenzylidene)-4-acetoxyaniline  
CAS RN: 10484-13-6

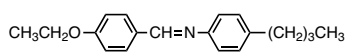
M0602 1g

Ethyl 4-[(4-Methoxybenzylidene)amino]cinnamate  
CAS RN: 6421-30-3

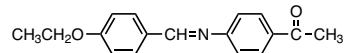
B0255 1g

Butyl 4-[(4-Methoxybenzylidene)amino]cinnamate  
CAS RN: 16833-17-3

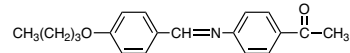
E0262 25g 500g

4'-Ethoxybenzylidene-4-butylaniline  
CAS RN: 29743-08-6

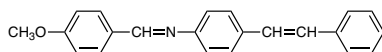
E0254 1g

N-(4-Ethoxybenzylidene)-4-acetylaniline  
CAS RN: 17224-17-8

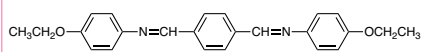
B0372 1g

N-(4-Butoxybenzylidene)-4-acetylaniline  
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M0603 1g

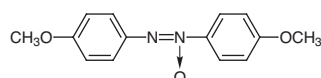
4-[(Methoxybenzylidene)amino]stilbene  
CAS RN: 322413-12-7

B0871 5g 25g

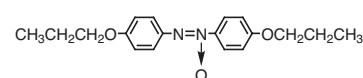
Terephthalbis(p-phenetidine)  
CAS RN: 17696-60-5

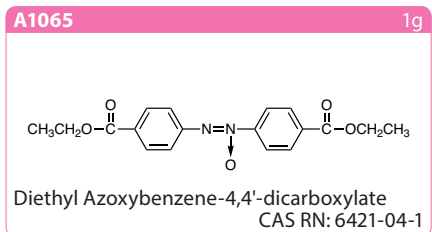
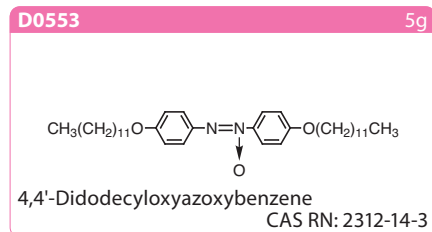
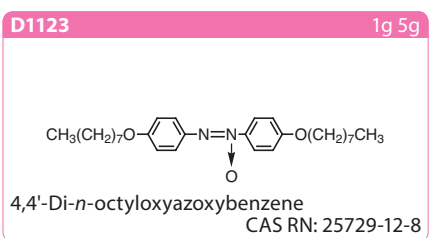
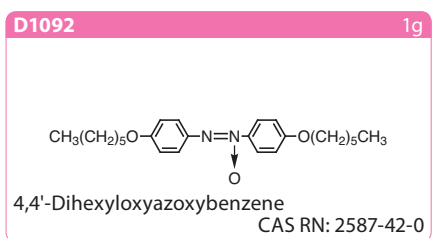
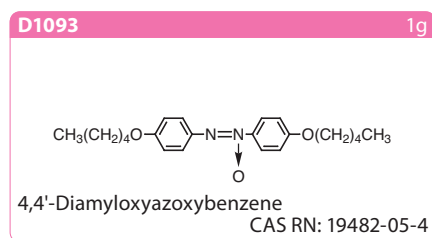
## Azoxybenzenes

A0554 5g 25g

4,4'-Azoxydianisole  
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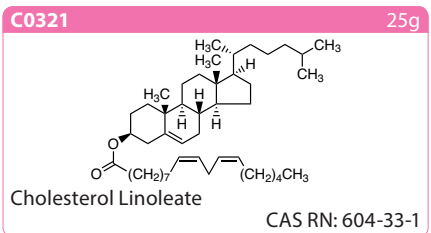
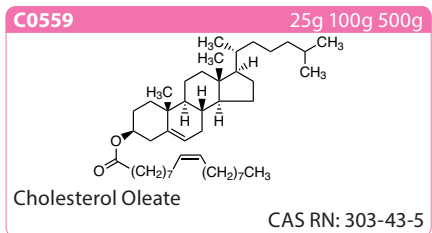
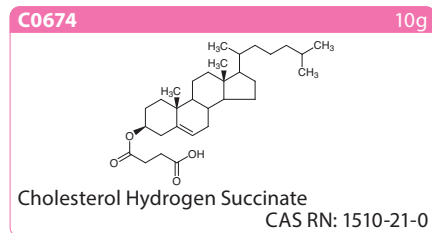
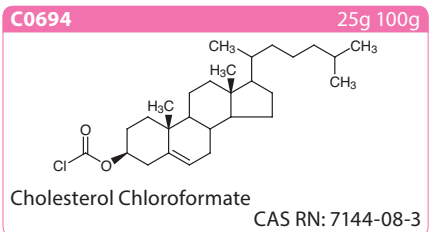
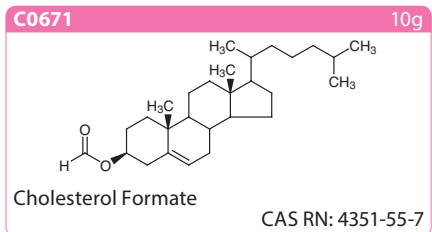
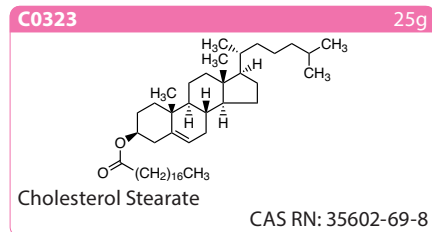
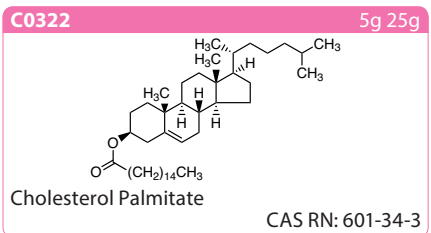
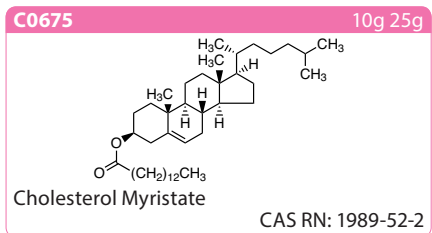
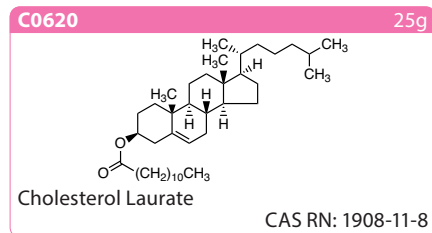
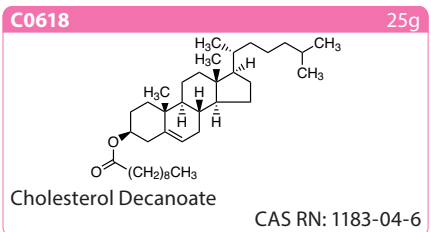
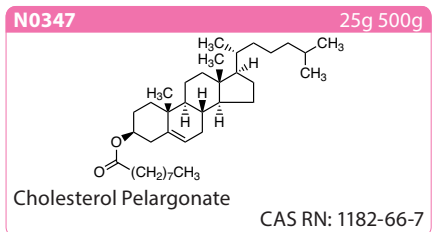
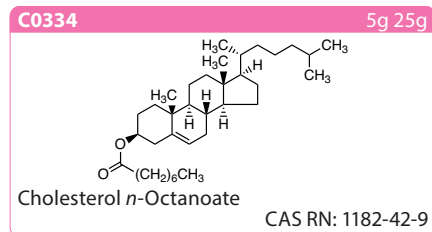
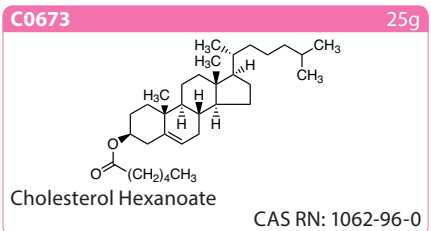
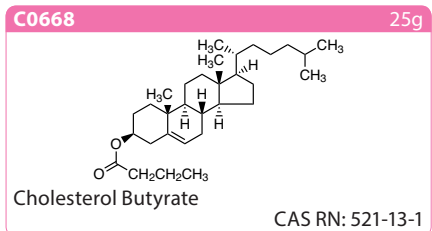
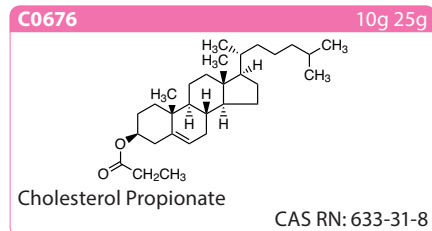
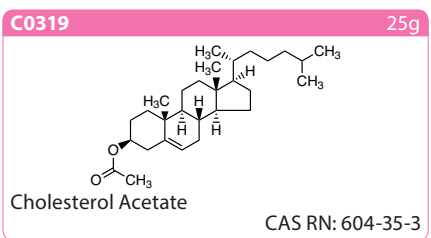
D1094 5g

4,4'-Dipropoxyazoxybenzene  
CAS RN: 23315-55-1

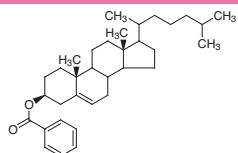


## Cholesteric Liquid Crystals

## Cholesteryl Compounds



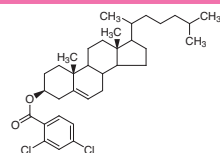
C0320 25g



Cholesterol Benzoate

CAS RN: 604-32-0

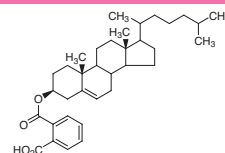
C1260 25g



Cholesterol 2,4-Dichlorobenzoate

CAS RN: 32832-01-2

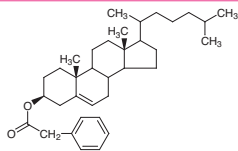
C0692 10g



Cholesterol Hydrogen Phthalate

CAS RN: 6732-01-0

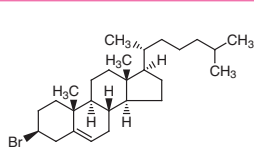
C0693 10g



Cholesterol Phenylacetate

CAS RN: 33998-26-4

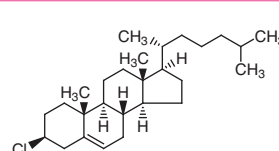
C0695 10g



Cholesteryl Bromide

CAS RN: 516-91-6

C0610 25g

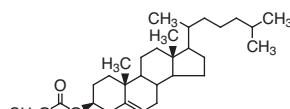


Cholesteryl Chloride

CAS RN: 910-31-6

## Cholesteryl Carbonates

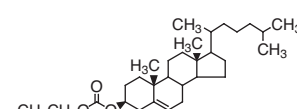
C0715 10g



Cholesterol Methyl Carbonate

CAS RN: 15507-52-5

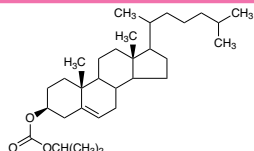
C0716 10g



Cholesterol Ethyl Carbonate

CAS RN: 23836-43-3

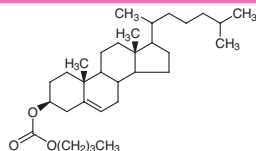
C0717 10g



Cholesterol Isopropyl Carbonate

CAS RN: 78916-25-3

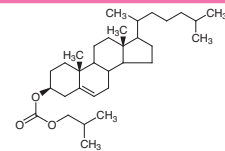
C0718 10g



Cholesterol Butyl Carbonate

CAS RN: 41371-14-6

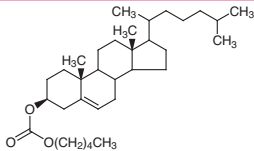
C0719 10g



Cholesterol Isobutyl Carbonate

CAS RN: 77546-35-1

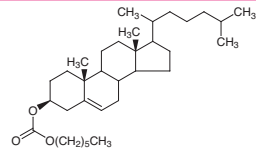
C0720 1g 10g



Cholesterol Amyl Carbonate

CAS RN: 15455-79-5

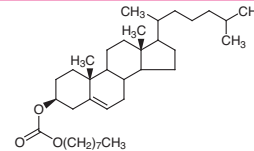
C0725 10g



Cholesterol Hexyl Carbonate

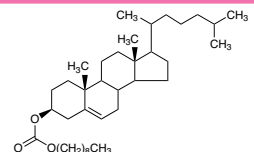
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C0721 10g

Cholesterol *n*-Octyl Carbonate

CAS RN: 15455-82-0

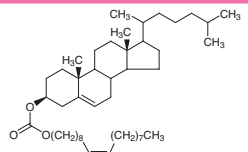
B0256 1g 10g



Cholesterol Nonyl Carbonate

CAS RN: 15455-83-1

C0691 10g 25g

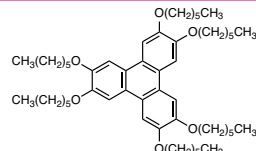


Cholesterol Oleyl Carbonate

CAS RN: 17110-51-9

## Discotic Liquid Crystals

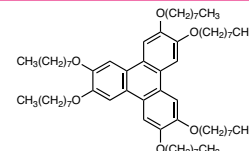
H1449 200mg 1g



2,3,6,7,10,11-Hexakis(hexyloxy)triphenylene

CAS RN: 70351-86-9

H1450 200mg 1g

2,3,6,7,10,11-Hexakis[(*n*-octyl)oxy]triphenylene

CAS RN: 70351-87-0

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