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Технические характеристики

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Россия +7(495)268-04-70

Казахстан +7(7172)727-132

Киргизия +996(312)96-26-47

Адрес: <https://tci.nt-rt.ru/> || эл.почта: tic@nt-rt.ru

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^{1,2)} and shuttlecock-shaped fullerene derivatives³⁾ 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) mode⁴⁾ 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 1977.⁵⁾

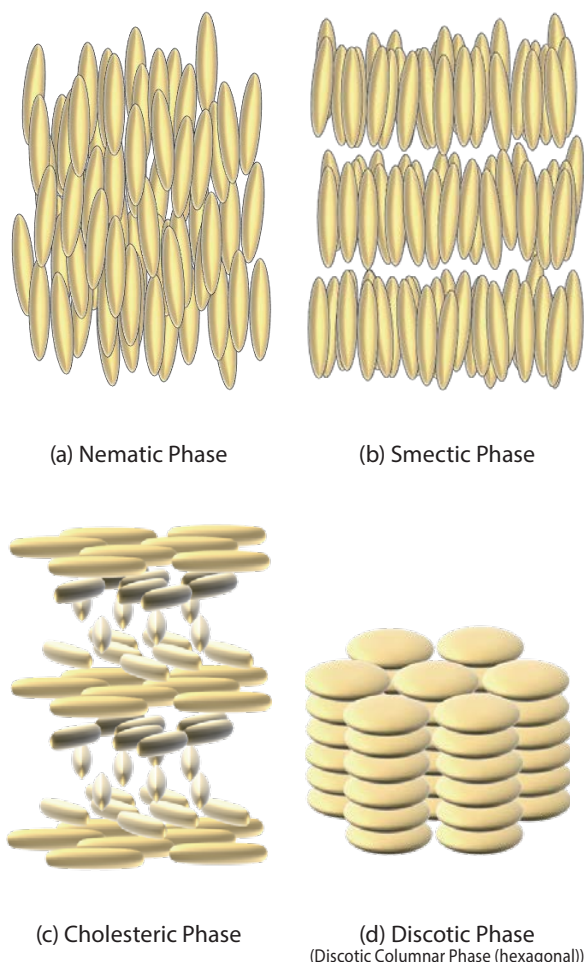


Figure 1. Illustration of typical liquid crystal phases

● 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^{6,7)} and to be photonic crystals for laser oscillations.^{8,9)} 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 ~ 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 ~ 60 °C by forming polymers in the blue phase (polymer-stabilized blue phase)¹⁰⁾ and up to ~ 40 °C by developing two biphenyl-linked compounds.¹¹⁾

● 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,¹²⁾ discotic ones have been developed.¹³⁾ 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).¹⁴⁾

● 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.¹⁵⁾ Other examples for such studies are synthesis of mesoporous silica in the reaction media composed of lyotropic liquid crystals¹⁶⁾ and realization of oriented carbon nanotubes in liquid crystal media.¹⁷⁾

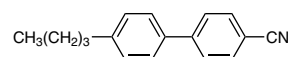
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Nematic / Smectic
Liquid CrystalsCyanobiphenyls &
Analog

B4923

5g

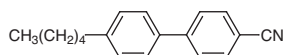


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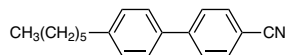


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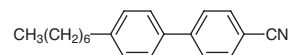


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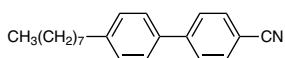


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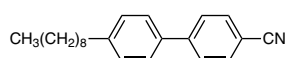


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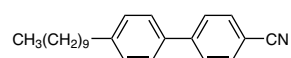


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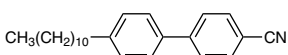


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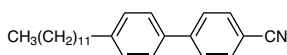


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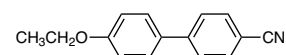


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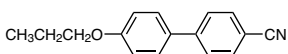


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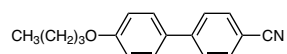


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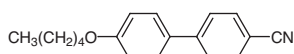


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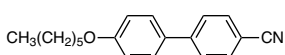


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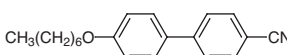


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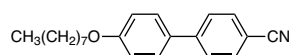


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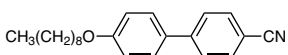


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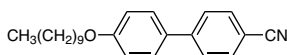


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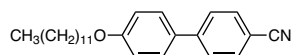


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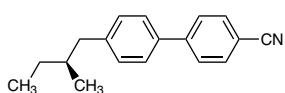


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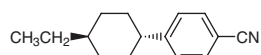


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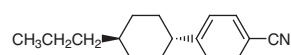
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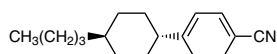
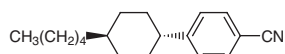
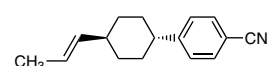
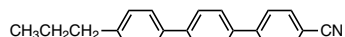
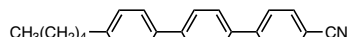
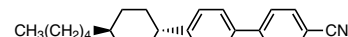
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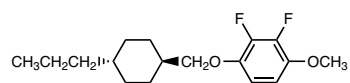
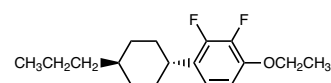
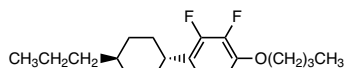
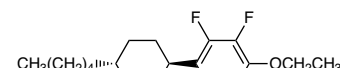
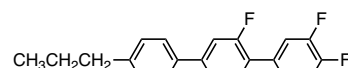
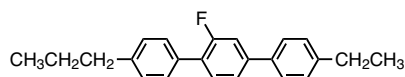
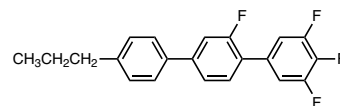
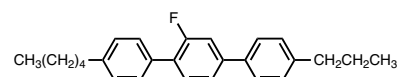
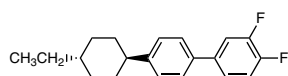
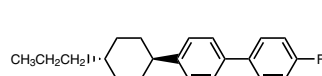
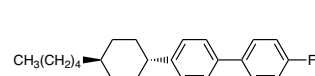
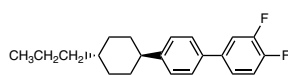
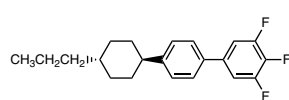
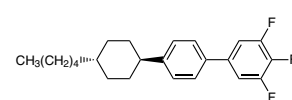
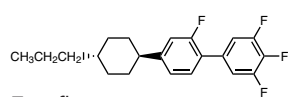
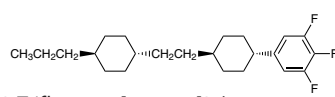
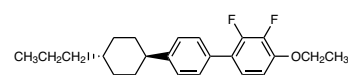
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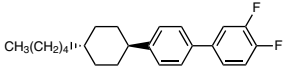
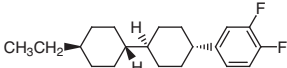
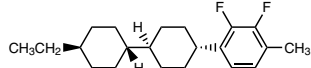
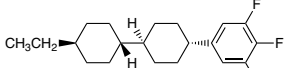
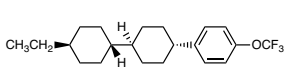
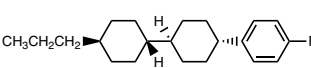
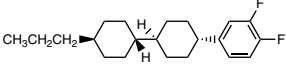
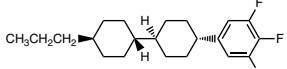
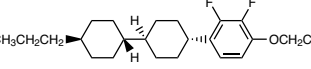
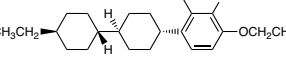
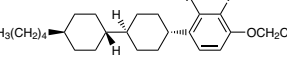
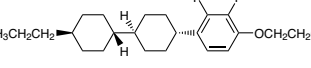
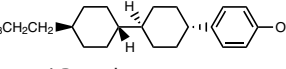
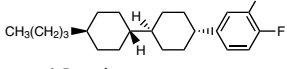
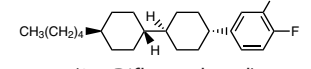
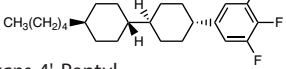
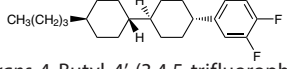
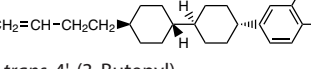
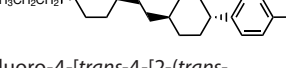
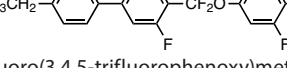
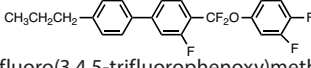
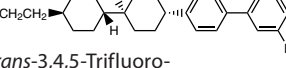
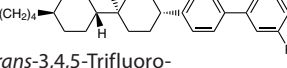
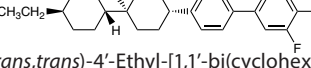
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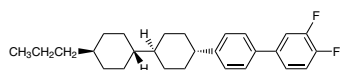
4-(trans-4-Propylcyclohexyl)benzonitrile
CAS RN: 61203-99-4

B4924 5g 25g4-(*trans*-4-Butylcyclohexyl)benzonitrile
CAS RN: 61204-00-0**A1828** 5g 25g4-(*trans*-4-Amylcyclohexyl)benzonitrile
CAS RN: 61204-01-1**P2378** 1g 5g4-[*trans*-4-[(*E*)-1-Propenyl]cyclohexyl]benzonitrile
CAS RN: 96184-40-6**C3271** 1g4-Cyano-4''-propyl-*p*-terphenyl
CAS RN: 54296-25-2**C2910** 1g 5g4-Cyano-4''-pentyl-*p*-terphenyl
CAS RN: 54211-46-0**A2568** 1g 5g4'-(*trans*-4-Amylcyclohexyl)biphenyl-4-carbonitrile
CAS RN: 68065-81-6

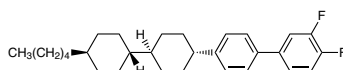
Fluorinated Biphenyls & Analogs

D4909 1g 5g2,3-Difluoro-4-[(*trans*-4-propylcyclohexyl)-methoxy]anisole
CAS RN: 1373116-00-7**E1230** 1g 5g1-Ethoxy-2,3-difluoro-4-(*trans*-4-propylcyclohexyl)benzene
CAS RN: 174350-05-1**B5364** 1g 5g1-Butoxy-2,3-difluoro-4-(*trans*-4-propylcyclohexyl)benzene
CAS RN: 208709-55-1**E1389** 1g 5g*trans*-1-Ethoxy-2,3-difluoro-4-(4-pentylcyclohexyl)benzene
CAS RN: 124729-02-8**T3419** 1g 5g2',3,4-Trifluoro-4''-propyl-1,1':4',1''-terphenyl
CAS RN: 248936-60-9**E1264** 1g 5g4''-Ethyl-2'-fluoro-4-propyl-1,1':4',1''-terphenyl
CAS RN: 95759-44-7**T3318** 1g 5g2',3,4,5-Tetrafluoro-4''-propyl-1,1':4',1''-terphenyl
CAS RN: 205806-87-7**F1046** 1g 5g2'-Fluoro-4-pentyl-4''-propyl-1,1':4',1''-terphenyl
CAS RN: 95759-51-6**D4859** 5g 25g3,4-Difluoro-4'-(*trans*-4-ethylcyclohexyl)biphenyl
CAS RN: 134412-18-3**F1103** 1g 5g4-Fluoro-4'-(*trans*-4-propylcyclohexyl)biphenyl
CAS RN: 87260-24-0**F1121** 1g 5g4-Fluoro-4'-(*trans*-4-pentylcyclohexyl)biphenyl
CAS RN: 81793-59-1**D4535** 5g 25g3,4-Difluoro-4'-(*trans*-4-propylcyclohexyl)biphenyl
CAS RN: 85312-59-0**T3260** 1g 5g3,4,5-Trifluoro-4'-(*trans*-4-propylcyclohexyl)biphenyl
CAS RN: 132123-39-8**T3397** 1g 5g3,4,5-Trifluoro-4'-(*trans*-4-pentylcyclohexyl)biphenyl
CAS RN: 137019-95-5**T3317** 1g 5g2',3,4,5-Tetrafluoro-4'-(*trans*-4-propylcyclohexyl)biphenyl
CAS RN: 173837-35-9**T3466** 1g 5g1,2,3-Trifluoro-5-[*trans*-4-[2-(*trans*-4-propylcyclohexyl)ethyl]cyclohexyl]benzene
CAS RN: 131819-24-4**E1158** 5g 25g4-Ethoxy-2,3-difluoro-4'-(*trans*-4-propylcyclohexyl)biphenyl
CAS RN: 189750-98-9

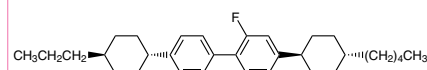
D4534 5g 25g  3,4-Difluoro-4'-(<i>trans</i> -4-pentylcyclohexyl)biphenyl CAS RN: 134412-17-2	D3856 1g 5g  <i>trans</i> -4-(3,4-Difluorophenyl)- <i>trans</i> -4'-ethylbicyclohexane CAS RN: 118164-50-4	D5127 1g 5g  <i>trans,trans</i> -4-(2,3-Difluoro-4-methylphenyl)-4'-ethylbicyclohexyl CAS RN: 174350-08-4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

D5650 1g 5g

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

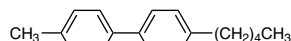
D5651 1g 5g

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

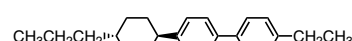
F1122 1g 5g

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

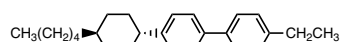
Other Biphenyls & Analogs

M2885 1g 5g

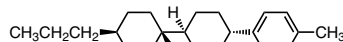
4'-Methyl-4-pentylbiphenyl
CAS RN: 64835-63-8

E1162 5g 25g

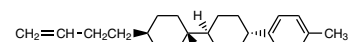
4-Ethyl-4'-(*trans*-4-propylcyclohexyl)biphenyl
CAS RN: 84540-37-4

E1254 1g 5g

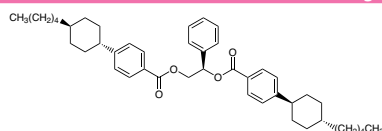
4-Ethyl-4'-(*trans*-4-pentylcyclohexyl)biphenyl
CAS RN: 79709-85-6

P2404 1g 5g

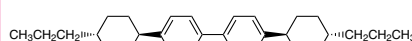
trans,trans-4'-Propyl-4-(*p*-tolyl)bicyclohexyl
CAS RN: 84656-75-7

B4915 1g 5g

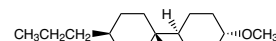
trans,trans-4'-(3-Butenyl)-4-(*p*-tolyl)bicyclohexyl
CAS RN: 129738-42-7

P2150 200mg 1g

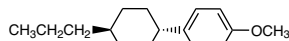
(*R*)-1-Phenyl-1,2-ethanediyl Bis[4-(*trans*-4-pentylcyclohexyl)benzoate]
CAS RN: 154102-21-3

B5881 5g 25g

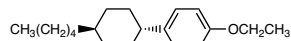
4,4'-Bis(*trans*-4-propylcyclohexyl)biphenyl
CAS RN: 85600-56-2

M3140 5g

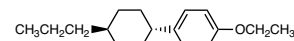
trans,trans-4-Methoxy-4'-propyl-1,1'-bicyclohexyl
CAS RN: 97398-80-6

M3152 5g 25g

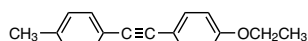
1-Methoxy-4-(*trans*-4-propylcyclohexyl)benzene
CAS RN: 81936-32-5

E1367 5g 25g

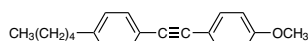
1-Ethoxy-4-(*trans*-4-pentylcyclohexyl)benzene
CAS RN: 84540-32-9

E1369 5g 25g

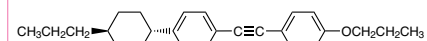
1-Ethoxy-4-(*trans*-4-propylcyclohexyl)benzene
CAS RN: 80944-44-1

E1342 1g 5g

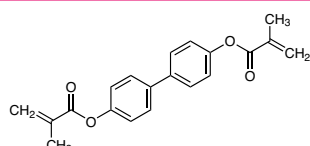
1-Ethoxy-4-(*p*-tolyethynyl)benzene
CAS RN: 116903-46-9

M3230 5g 25g

1-Methoxy-4-[(4-pentylphenyl)ethynyl]benzene
CAS RN: 39969-28-3

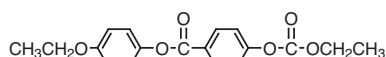
P2440 1g 5g

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

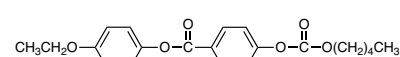
B5961 1g 5g

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

Carbonates

E0257 1g

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

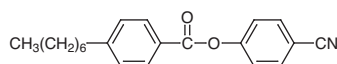
A0608 1g

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

Phenyl Esters

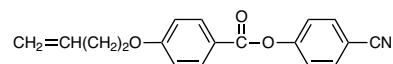
H0810

1g 5g

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

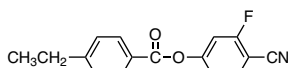
B1586

1g

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

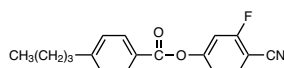
C3540

5g 25g

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

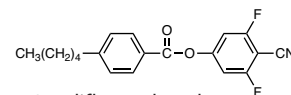
C3341

1g

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

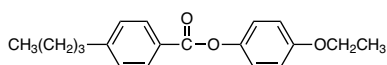
C3512

1g 5g

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

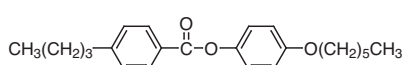
B0375

1g

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

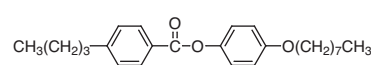
B1091

1g

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

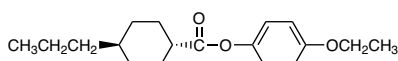
B1092

1g

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

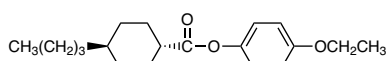
E1395

25g 100g

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

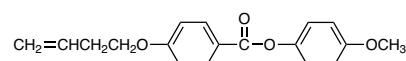
E1396

25g 100g

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

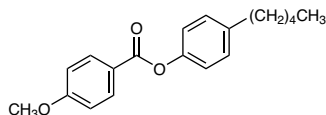
M2106

1g 5g

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

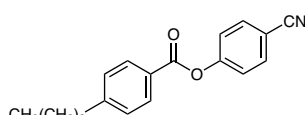
P2692

5g

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

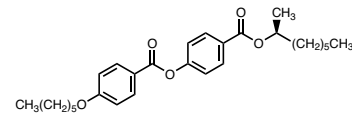
C3794

5g 25g

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

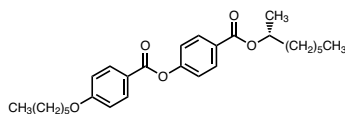
O0461

1g 5g

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

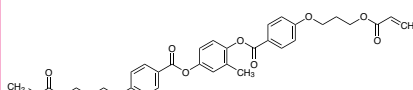
O0460

1g

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

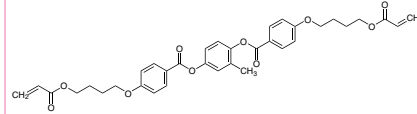
B5356

200mg 1g

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

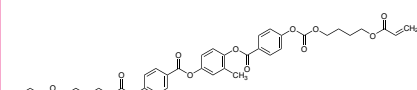
D5936

1g 5g

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

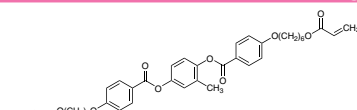
M3368

1g 5g 25g

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

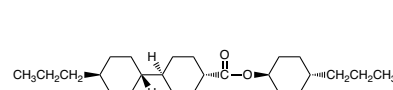
M3585

1g 5g

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

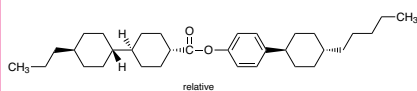
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1g 5g

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

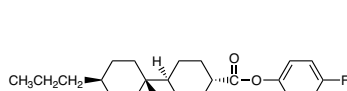
P2696

1g 5g

4-(*trans*-4-Pentylcyclohexyl)phenyl
(*trans,trans*-4'-Propyl-[1,1'-bi(cyclohexane)]-
4-carboxylate
CAS RN: 131790-53-3

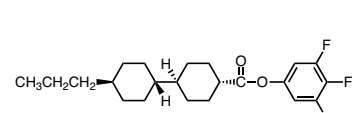
F1312

5g 25g

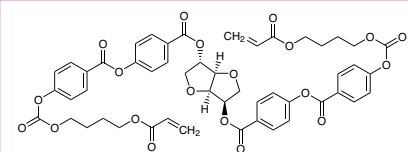
4-Fluorophenyl *trans,trans*-
4'-Propyl[1,1'-bi(cyclohexyl)]-4-carboxylate
CAS RN: 81701-13-5

T3756

5g 25g

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

B6483 200mg 1g

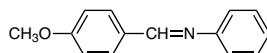


LC 756

CAS RN: 223572-88-1

Schiff Bases

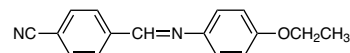
M0582 5g 25g



N-(4-Methoxybenzylidene)aniline

CAS RN: 836-41-9

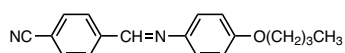
C0744 1g



4'-Cyanobenzylidene-4-ethoxyaniline

CAS RN: 34128-02-4

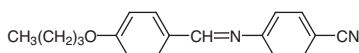
C0743 1g



4'-Cyanobenzylidene-4-butoxyaniline

CAS RN: 55873-21-7

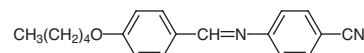
B0252 1g



4'-Butoxybenzylidene-4-cyanoaniline

CAS RN: 36405-17-1

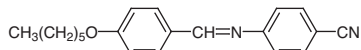
B0253 1g



4'-(Amyloxy)benzylidene-4-cyanoaniline

CAS RN: 37075-25-5

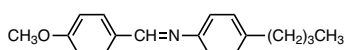
H0419 1g



4'-Hexyloxybenzylidene-4-cyanoaniline

CAS RN: 35280-78-5

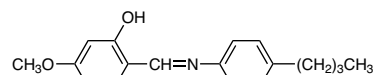
M0275 25g



N-(4-Methoxybenzylidene)-4-butylaniline

CAS RN: 26227-73-6

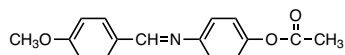
B0250 1g



N-(4-Methoxy-2-hydroxybenzylidene)-4-butylaniline

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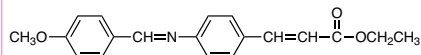
M0581 25g



N-(4-Methoxybenzylidene)-4-acetoxyaniline

CAS RN: 10484-13-6

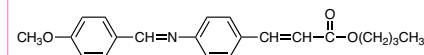
M0602 1g



Ethyl 4-[(4-Methoxybenzylidene)amino]cinnamate

CAS RN: 6421-30-3

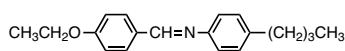
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Butyl 4-[(4-Methoxybenzylidene)amino]cinnamate

CAS RN: 16833-17-3

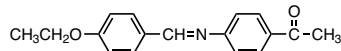
E0262 25g 500g



4'-Ethoxybenzylidene-4-butylaniline

CAS RN: 29743-08-6

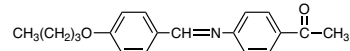
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N-(4-Ethoxybenzylidene)-4-acetylaniline

CAS RN: 17224-17-8

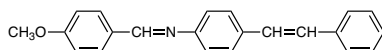
B0372 1g



N-(4-Butoxybenzylidene)-4-acetylaniline

CAS RN: 17224-18-9

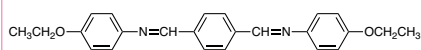
M0603 1g



4-[(Methoxybenzylidene)amino]stilbene

CAS RN: 322413-12-7

B0871 5g 25g

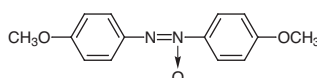


Terephthalbis(p-phenetidine)

CAS RN: 17696-60-5

Azoxybenzenes

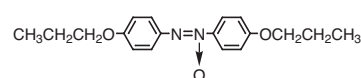
A0554 5g 25g



4,4'-Azoxydianisole

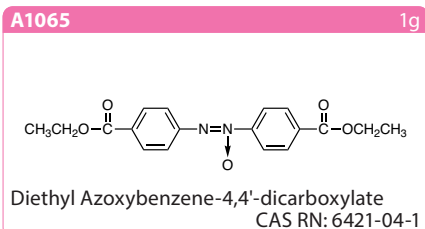
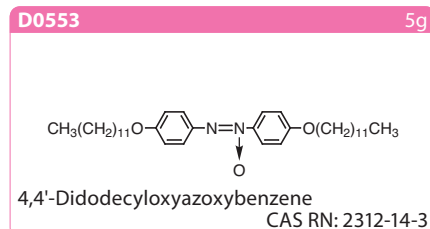
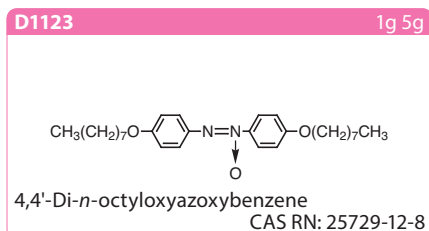
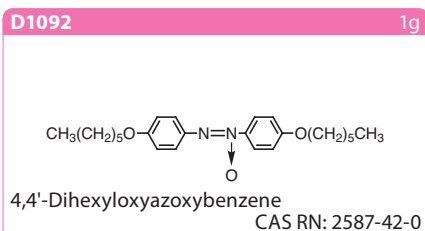
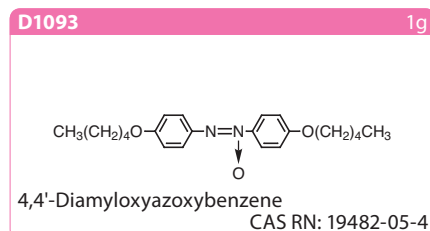
CAS RN: 1562-94-3

D1094 5g



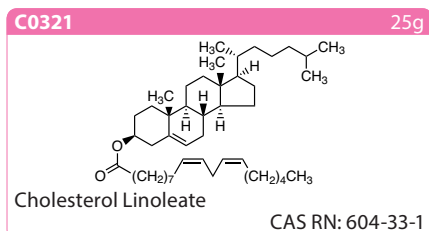
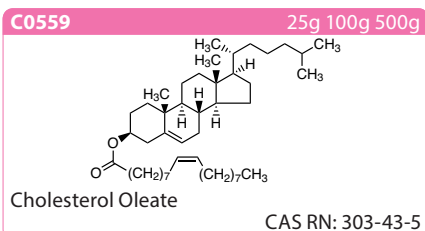
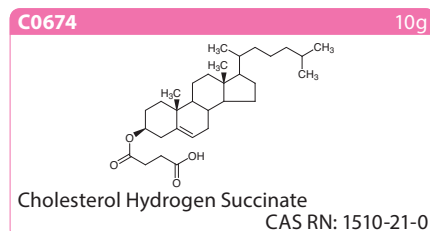
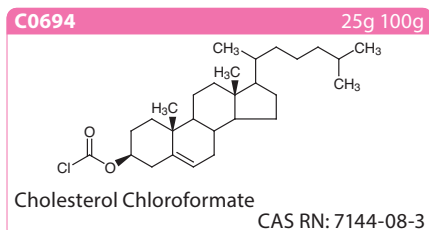
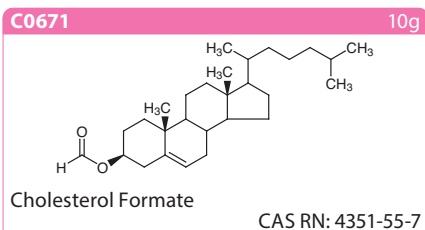
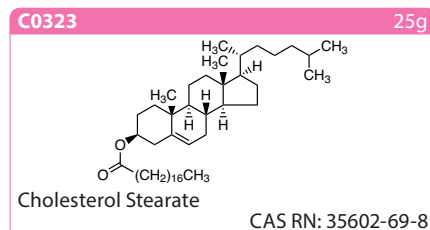
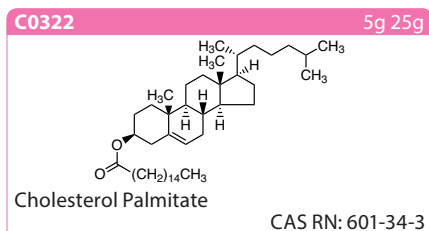
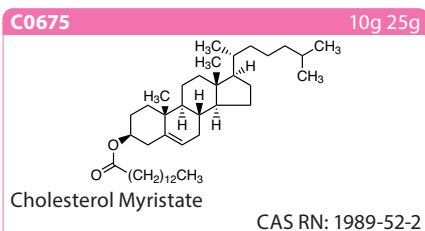
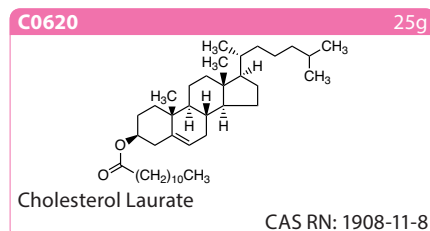
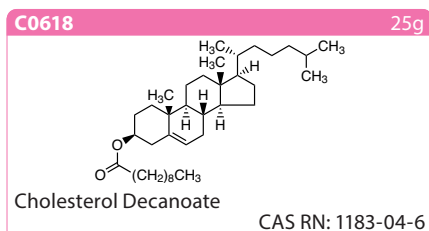
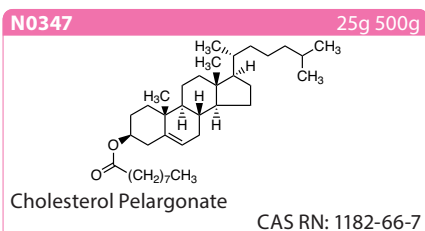
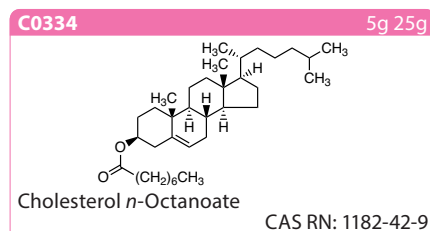
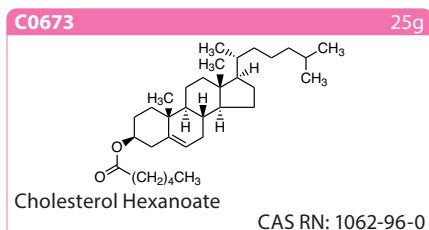
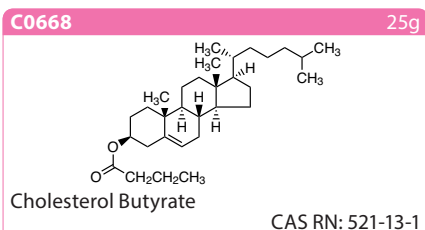
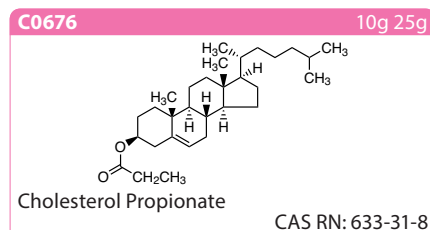
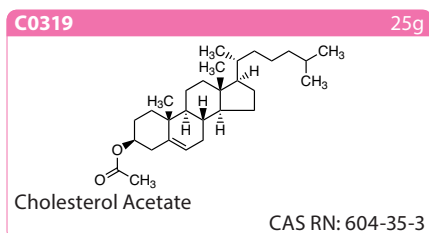
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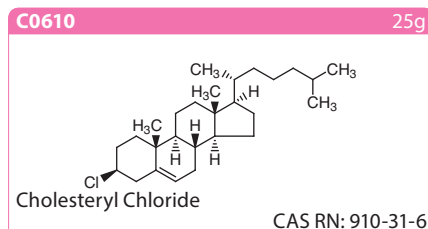
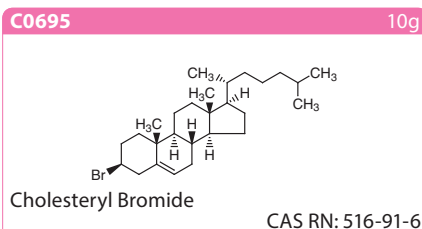
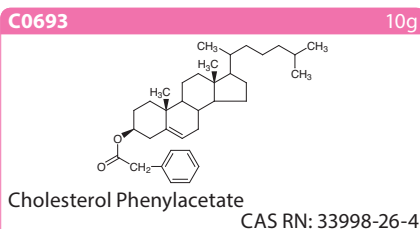
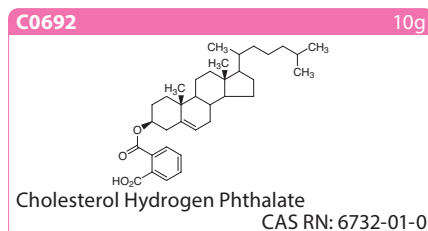
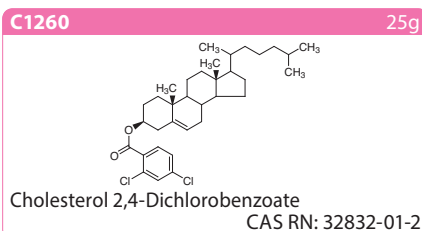
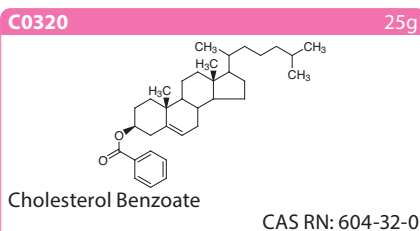
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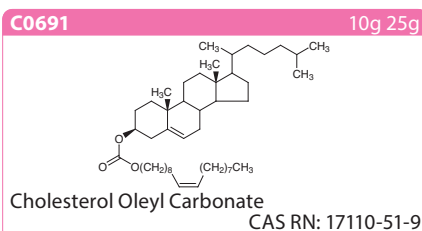
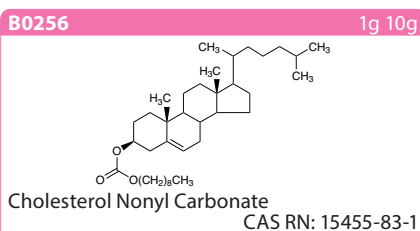
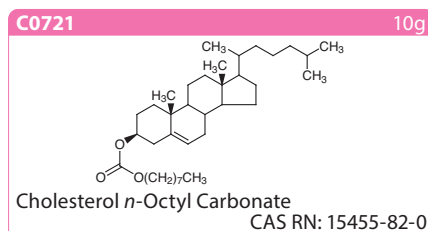
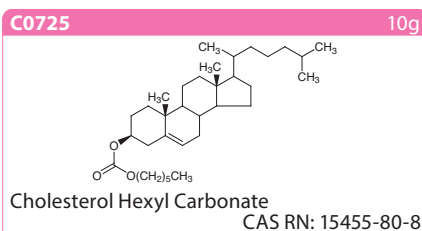
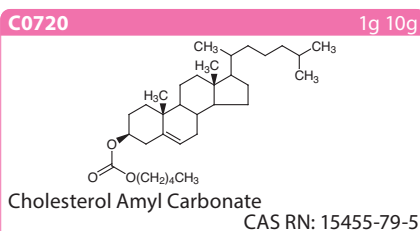
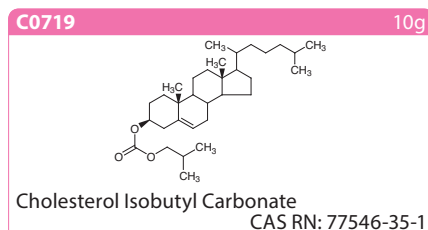
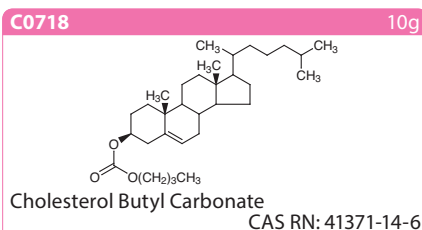
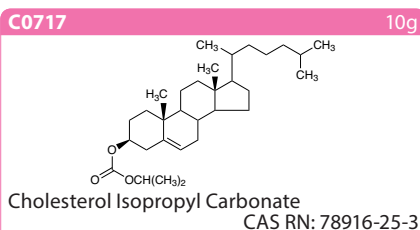
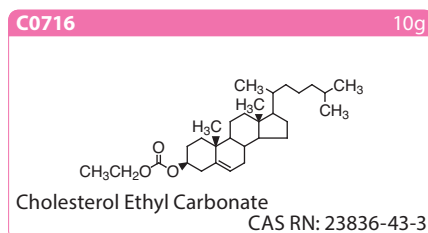
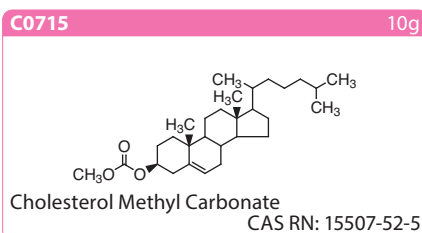
Cholesteric Liquid Crystals

Cholesteryl Compounds

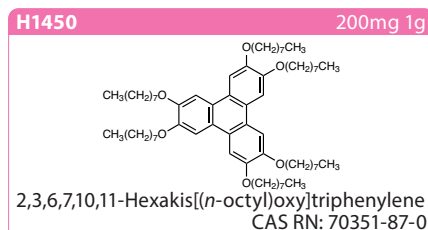
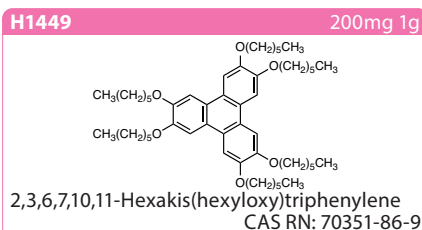




Cholesteryl Carbonates



Discotic Liquid Crystals



По вопросам продаж и поддержки обращайтесь:

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
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Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-4159
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Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
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Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
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Новосибирск (383)227-86-73

Омск (3812)21-46-40
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Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +7(7172)727-132

Киргизия +996(312)96-26-47

Адрес: <https://tci.nt-rt.ru/> || эл.почта: tic@nt-rt.ru