# MCPD

## ESTERS AND GLYCIDYL ESTERS IN FOOD

Product of the Month

## 3-MCPD

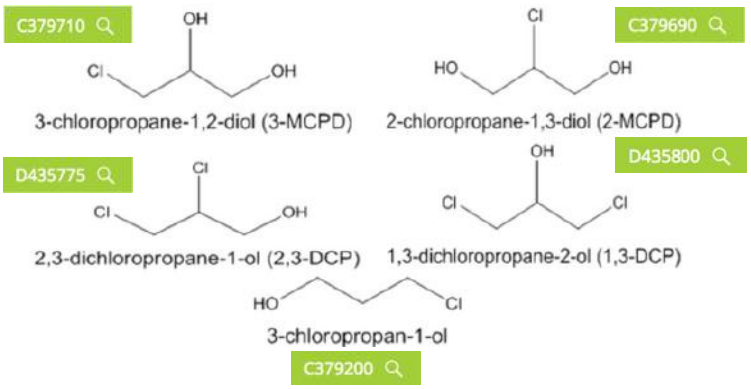
3-MCPD (3-monochloropropane-1,2-diol or 3-chloropropane-1,2-diol) is an organic chemical compound which is carcinogenic and highly suspected to be genotoxic in humans. It has male antifertility effects and is a chemical byproduct which may be formed in foods. It is primarily created in foods by protein hydrolysis by adding hydrochloric acid at high temperature to increase the breakdown of proteins into amino acids. Under these conditions, chloride can react with the glycerol backbone of lipids to produce 3-MCPD. It is also detected in foods, which have been in contact with materials containing epichlorohydrin-based wet-strength resins generally used in the production of tea bags and sausage casings.

## REGULATORY GUIDELINES

- FSANZ
- USFDA
- HEALTH CANADA
- EFSA
- FSAI
- WHO

## CHLOROPROPANOLS

Source: DOI: 10.1111/1541-4337.12120




## METHODS OF ANALYSIS

- Indirect Enzymatic Method
- QuEChERS Extraction
- Using GC-MS
- Tandem Mass Spectrometry
- Solid-Phase Extraction and GC-MS Analysis
- Proteomic analysis
- LC-MS/MS

## INTERNATIONAL CONCENTRATION LIMITS

| Country/Region | 3-MCPD (mg/kg) | Scope |
|---|---|---|
| Australia/New Zealand | 0.2 | Soya/oyster sauces |
| Canada | 1 | Soya/oyster sauces |
| the People's Republic of China | 1 | Acid-HVP |
| European Union | 0.02 | HVP and soya sauces (40% solids) |
| Republic of Korea | 0.3 | Soya sauce containing acid-HVP |
| | 1 | HVP |
| Malaysia | 0.02 | Liquid foods with acid-HVP |
| | 1 | Acid-HVP, industrial product |
| Switzerland | 0.2 | Savoury sauces |
| Thailand | 1 | Hydrolysed soya bean protein |
| USA | 1 | Acid-HVP |

Source: IARC MONOGRAPHS 101

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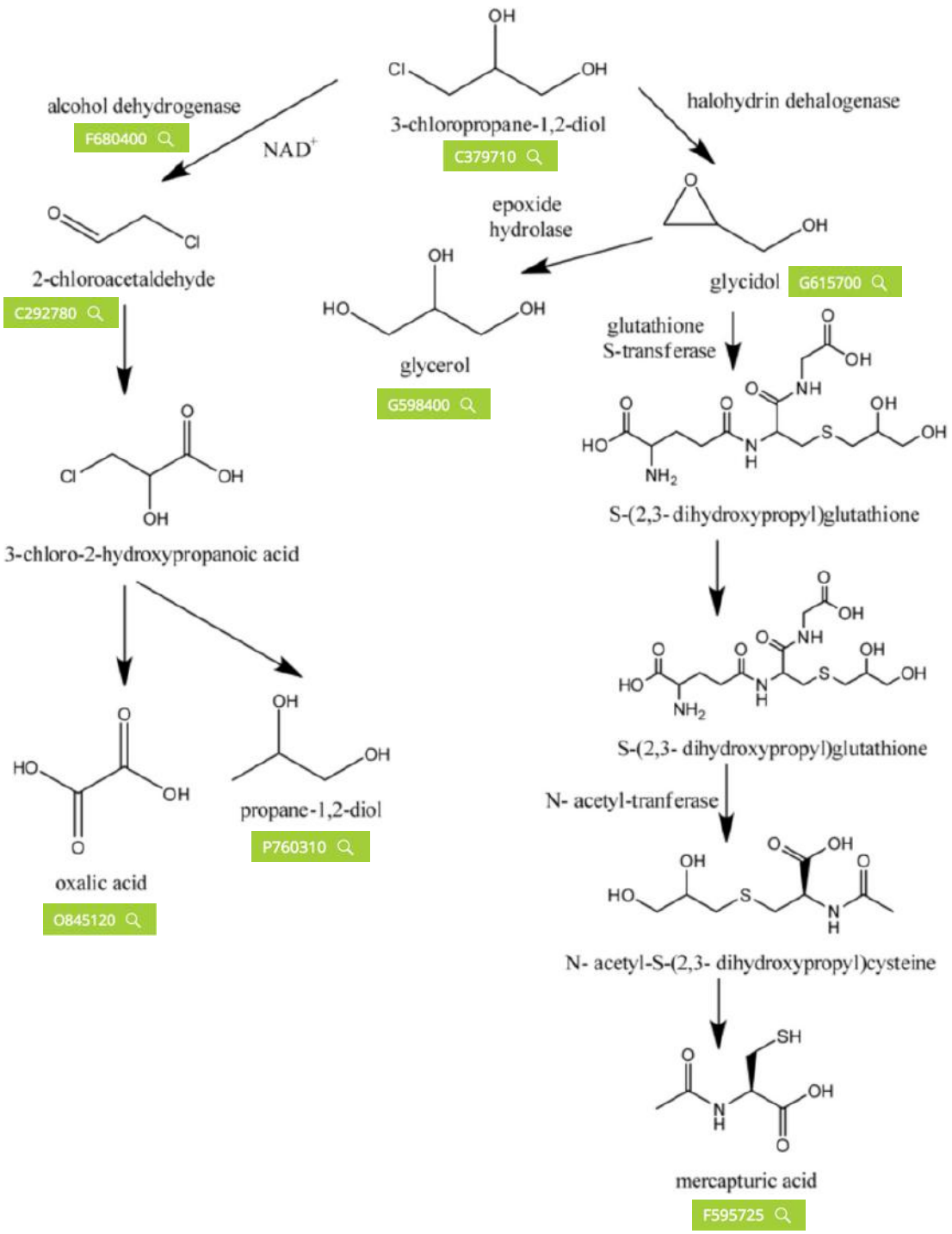
# HYPOTHESIZED METABOLIC PATHWAY FOR 3-MCPD

Source: IARC MONOGRAPHS 101



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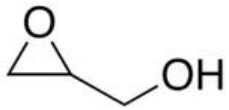


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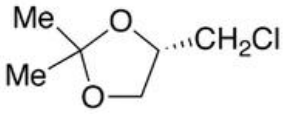


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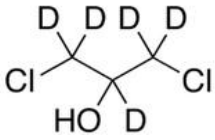


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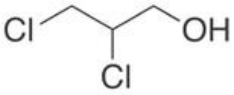


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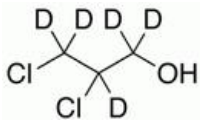


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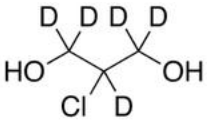


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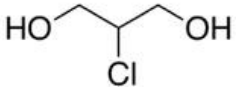


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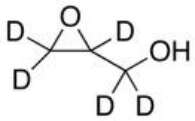


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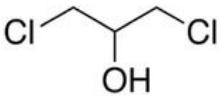


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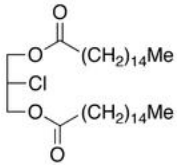

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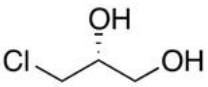
CAS number: 57090-45-6



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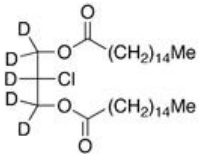

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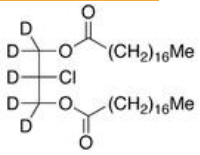

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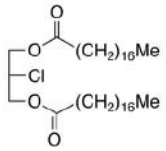

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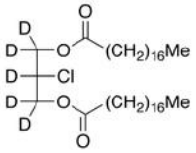

Catalogue No: D460595
Chemical Name: rac-1,2-Dilinoleoyl-3-chloropropanediol
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Catalogue No: D482200
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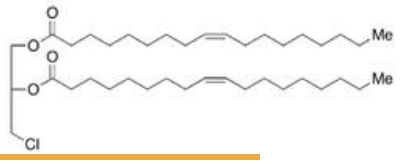

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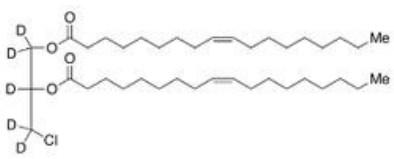

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# SELECTION OF RELATED COMPOUNDS FROM TRC

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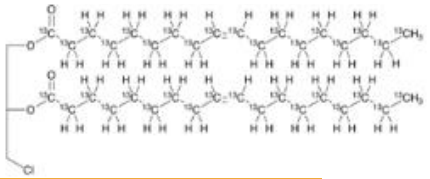

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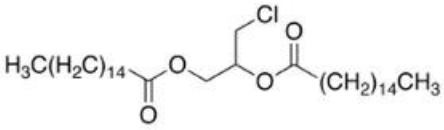

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Chemical Name: rac 1,2-Bis-palmitoyl-3-chloropropanediol-D5
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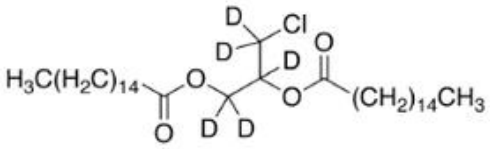

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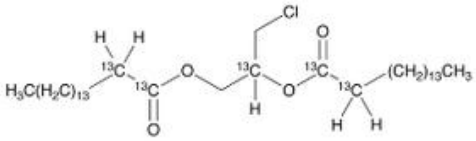

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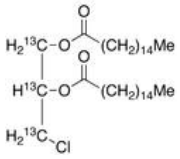

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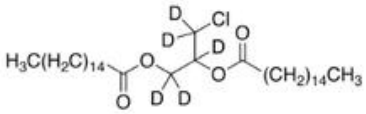

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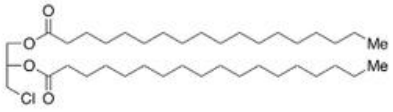

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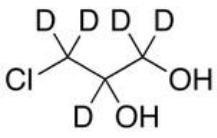

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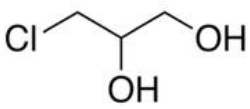

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# SELECTION OF RELATED COMPOUNDS FROM TRC

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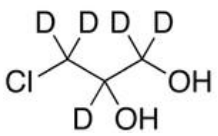

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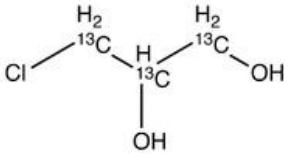

Catalogue No: C369405
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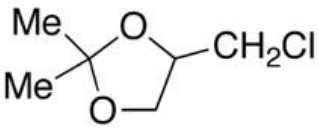

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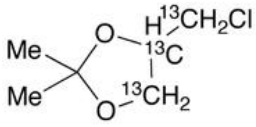

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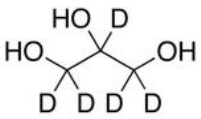
CAS number: 62502-71-0



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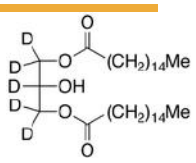
CAS number: 65615-82-9



Catalogue No: G615720
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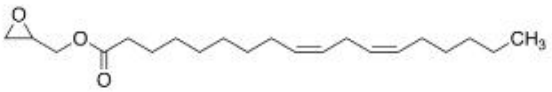
CAS number: 24305-63-3



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Catalogue No: G615930
Chemical Name: Glycidyl Oleate
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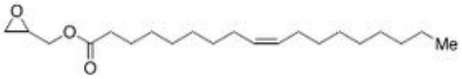

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# SELECTION OF RELATED COMPOUNDS FROM TRC

Catalogue No: G615932
Chemical Name: Glycidyl Oleate-d5
CAS number: 1426395-63-2
Labeled

Catalogue No: G615933
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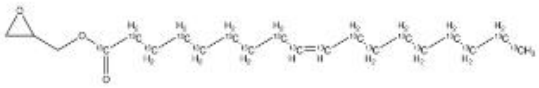

Catalogue No: G615950
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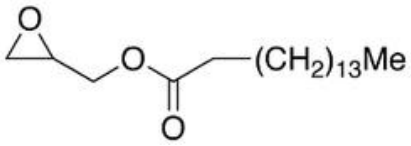
CAS number: 7501-44-2



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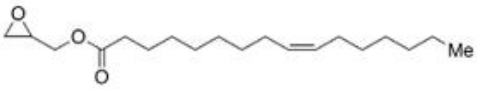

Catalogue No: G615985
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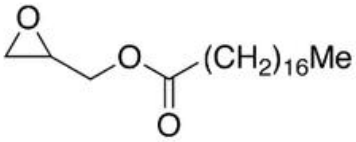
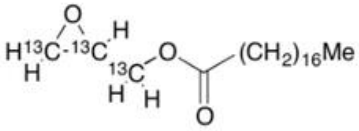
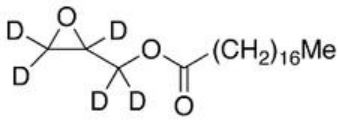
CAS number: 7460-84-6



Catalogue No: G615986
Chemical Name: Glycidyl Stearate-13C3
CAS number: 1346598-19-3
Labeled

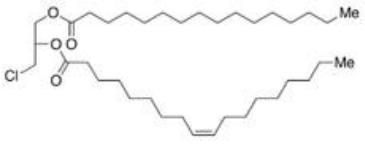


Catalogue No: G615988
Chemical Name: Glycidyl Stearate-d5
CAS number: 1346598-19-3
Labeled



Catalogue No: C379200
Chemical Name: 3-Chloro-1-propanol
CAS number: 627-30-5

Catalogue No: P160500
Chemical Name: rac 1-Palmitoyl-2-oleoyl-3-chloropropanediol
CAS number: 1363153-60-9



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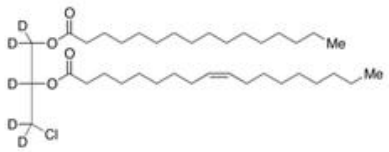
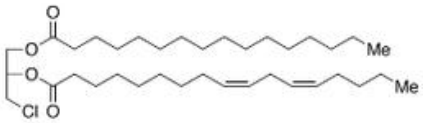
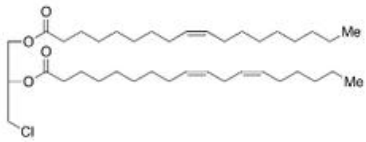
Catalogue No: P160502 Labeled
Chemical Name: rac 1-Palmitoyl-2-oleoyl-3-chloropropanediol-d5



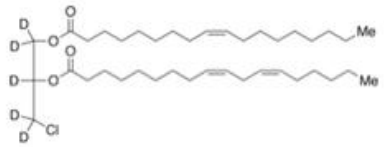
Catalogue No: P158950
Chemical Name: rac-1-Palmitoyl-2-linoleoyl-3-chloropropanediol
CAS number: 1246833-87-3



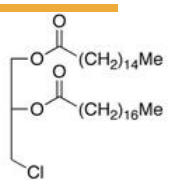
Catalogue No: O530500
Chemical Name: rac 1-Oleoyl-2-linoleoyl-3-chloropropanediol
CAS number: 1336935-03-5



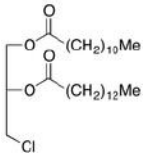
Catalogue No: O530502 Labeled
Chemical Name: rac 1-Oleoyl-2-linoleoyl-3-chloropropanediol-d5



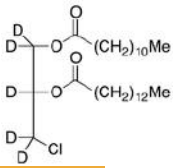
Catalogue No: P163500
Chemical Name: rac 1-Palmitoyl-2-stearoyl-3-chloropropanediol
CAS number: 1185060-41-6



Catalogue No: L178700
Chemical Name: 1-Lauroyl-2-myristoyl-3-chloropropanediol



Catalogue No: L178702 Labeled
Chemical Name: 1-Lauroyl-2-myristoyl-3-chloropropanediol-d5



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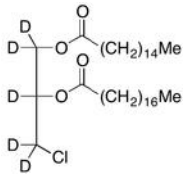
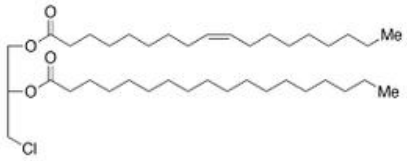


Catalogue No: O532900
Chemical Name: rac 1-Oleoyl-2-stearoyl-3-chloropropanediol
CAS number: 1336935-05-7



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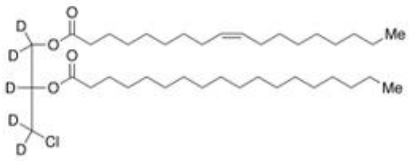
Catalogue No: O532902

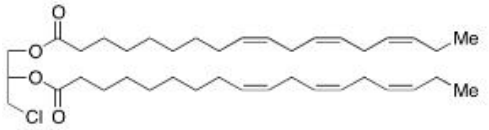
Chemical Name: rac 1-Oleoyl-2-stearoyl-3-chloropropanediol-d5



Catalogue No: D460565

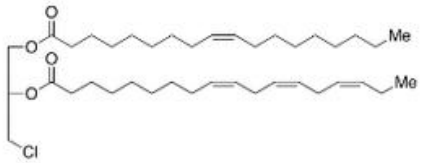
Chemical Name: rac-1,2-Dilinolenoyl-3-chloropropanediol

CAS number: 74875-97-1



Catalogue No: O530400

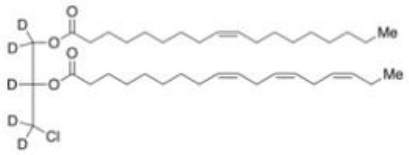
Chemical Name: rac 1-Oleoyl-2-linolenoyl-3-chloropropanediol



Labeled

Catalogue No: O530402

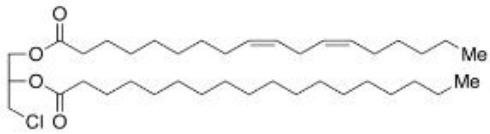
Chemical Name: rac 1-Oleoyl-2-linolenoyl-3-chloropropanediol-d5



Catalogue No: L468400

Chemical Name: rac-1-Linoleoyl-2-stearoyl-3-chloropropanediol

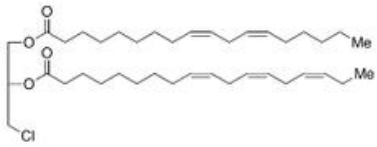
CAS number: 1246833-46-4



Catalogue No: L468080

Chemical Name: rac 1-Linoleoyl-2-linolenoyl-3-chloropropanediol

CAS number: 1612870-93-5

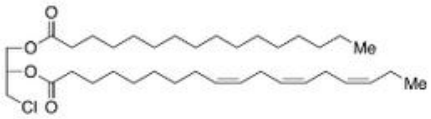


Labeled

Catalogue No: P158850

Chemical Name: rac-1-Palmitoyl-2-linolenoyl-3-chloropropanediol

CAS number: 1246833-14-6



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