

# Decyl Oleate

## 1 Nonproprietary Names

BP: Decyl Oleate  
PhEur: Decyl Oleate

## 2 Synonyms

*Ceraphyl 140*; decyl 9-octadecenoate; decyl octadec-9-enoate; decylis oleas; decyloleat; *DUBCARE OD*; *Kollicream DO*; oleic acid, decyl ester; *Tegosoft DO*.

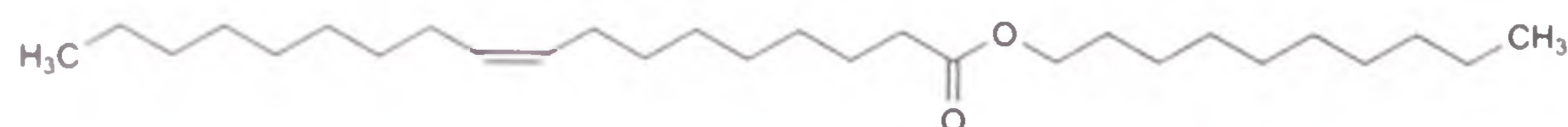
## 3 Chemical Name and CAS Registry Number

9-Octadecenoic acid (9Z)-, decyl ester [3687-46-5]

## 4 Empirical Formula and Molecular Weight

$C_{28}H_{54}O_2$  422.74

## 5 Structural Formula



## 6 Functional Category

Emollient; oleaginous vehicle.

## 7 Applications in Pharmaceutical Formulation or Technology

Decyl oleate is used as an emollient in pharmaceutical creams and lotions for skin and personal care products.

Decyl oleate has also been used in combination with carnauba wax as an encapsulation system for inorganic sunscreens.<sup>(1-4)</sup>

It has been evaluated as a skin penetration enhancer for flurbiprofen<sup>(5)</sup> and as a topical vehicle to be used in ready-to-use pharmaceutical bases,<sup>(6)</sup> microemulsions<sup>(7)</sup> and nanostructured lipid carriers.<sup>(8)</sup>

## 8 Description

The BP 2017 defines decyl oleate as a mixture of decyl esters of fatty acids, mainly oleic (*cis*-9-octadecenoic) acid.

Decyl oleate occurs as a clear, colorless, or pale yellow liquid.

## 9 Pharmacopeial Specifications

See Table I. See also Section 18.

**Table I:** Pharmacopeial specifications for decyl oleate.

Test	PhEur 9.2
Identification	+
Characters	+
Relative density	0.86–0.87
Acid value	≤ 1.0
Iodine value	55–70
Peroxide value	≤ 10.0
Saponification value	130–140
Oleic acid	≥ 60%
Water	≤ 1.0%
Total ash	≤ 0.1%

## 10 Typical Properties

*Boiling point* >300°C

*Flash point* 215°C

*Pour point* –6°C for *Tegosoft DO*<sup>(9)</sup>

*Refractive index* 1.453–1.456

*Solubility* Practically insoluble in water; miscible with ethanol (96%), methylene chloride, and light petroleum (40–60°C). Soluble in isopropyl myristate and oleyl alcohol.

*Surface tension* 31 mN/m at 25°C for *Tegosoft DO*<sup>(9)</sup>

*Viscosity* 16.6 mPa s (16.6 cP) at 25°C; approx 14.0 mPa s (14.0 cP) for *Tegosoft DO* at 25°C.<sup>(9)</sup>

## 11 Stability and Storage Conditions

Decyl oleate should be stored below 30°C and protected from moisture. Through the addition of mixed tocopherols, the product is protected from auto-oxidation.

Depending on the storage temperature, the peroxide value may increase. The product quality is not impaired as long as the peroxide value remains below 8.0.

## 12 Incompatibilities

Decyl oleate is incompatible with strong oxidizing agents.

## 13 Method of Manufacture

Decyl oleate is manufactured from decyl alcohol and oleic acid.

## 14 Safety

Decyl oleate is used in cosmetics and topical pharmaceutical formulations, and is generally regarded as a nontoxic and nonirritant material.

A 15% solution of decyl oleate in corn oil has been shown to be practically nonirritating in rabbit eye studies and nonsensitizing to guinea pig skin, and a 10% solution has been shown to be nonirritating to rabbit skin.<sup>(10)</sup> Repeat patch testing in humans with 5.5% decyl oleate produced a low number of reactions with a low total irritation score.<sup>(10)</sup>

LD<sub>50</sub> (rat, oral): 34.68 g/kg (40 mL/kg)<sup>(10)</sup>

## 15 Handling Precautions

Observe normal precautions appropriate to the circumstances and quantity of the material handled.

## 16 Regulatory Status

Included in the Canadian Natural Health Products Ingredients Database.

## 17 Related Substances

Isodecyl oleate.

### Isodecyl oleate

*Empirical formula*  $C_{28}H_{54}O_2$

*CAS number* [59231-34-4]

*Synonyms* 9-Octadecenoic acid, isodecyl ester; *Ceraphyl 140A*; *Schercemol* IDO ester.

*Appearance* A white to straw-colored liquid with characteristic odor.

*Acid value* ≤ 5.0 for *Schercemol* IDO ester.<sup>(11)</sup>

*Iodine value* 50–65 for *Schercemol* IDO ester.

*Refractive index* 1.455 for *Schercemol* IDO ester.