

Isopropyl Palmitate

1 Nonproprietary Names

BP: Isopropyl palmitate
PhEur: Isopropylis palmitas
USPNF: Isopropyl palmitate

2 Synonyms

Crodamol IPP; *Emerest 2316*; hexadecanoic acid isopropyl ester; hexadecanoic acid 1-methylethyl ester; isopropyl hexadecanoate; *Kessco IPP*; *Lexol IPP-NF*; *Liponate IPP*; palmitic acid isopropyl ester; *Protachem IPP*; *Rita IPP*; *Stepan IPP*; *Tegosoft P*; *Unimate IPP*; *Waglinol 6016*; *Wickenol 111*.

3 Chemical Name and CAS Registry Number

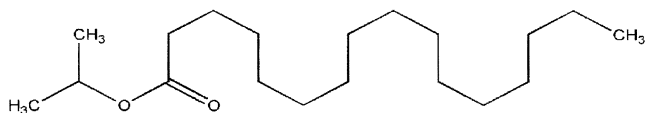
1-Methylethyl hexadecanoate [142-91-6]

4 Empirical Formula Molecular Weight

$C_{19}H_{38}O_2$

298.51

5 Structural Formula



6 Functional Category

Emollient; oleaginous vehicle; solvent.

7 Applications in Pharmaceutical Formulation or Technology

Isopropyl palmitate is a nonoleaginous emollient with good spreading characteristics, used in topical pharmaceutical formulations and cosmetics such as: bath oils; creams; lotions; make-up; hair care products; deodorants; lip products; suntan preparations; and pressed powders; *see* Table I.

Isopropyl palmitate has also been used in controlled-release percutaneous films, and has also been investigated in the production of reversed sucrose ester vesicles.⁽¹⁾

Table I: Uses of isopropyl palmitate.

Use	Concentration (%)
Detergent	0.005–0.02
Perfume	0.2–0.8
Soap	0.05–0.2
Topical aerosol spray	3.36
Topical creams and lotions	0.05–5.5

8 Description

Isopropyl palmitate is a clear, colorless to pale yellow-colored, practically odorless viscous liquid that solidifies at less than 16°C.

9 Pharmacopeial Specifications

See Table II.

Table II: Pharmacopeial specifications for isopropyl palmitate.

Test	PhEur 2002	USPNF 20
Identification	+	+
Acid value	≤ 1.0	≤ 1.0
Appearance of solution	+	—
Characters	—	+
Iodine value	≤ 1.0	≤ 1.0
Organic volatile impurities	—	+
Relative density	0.850–0.855	—
Residue on ignition	—	≤ 0.1%
Refractive index	1.436–1.440	1.435–1.438
Saponification value	183–193	183–193
Specific gravity	—	0.850–0.855
Sulfated ash	≤ 0.1%	—
Viscosity	5–10 mPa s	—
Water	≤ 0.1%	—
Assay (of $C_{19}H_{38}O_2$)	≥ 90.0%	≥ 90.0%

10 Typical Properties

Boiling point: 160°C at 266 Pa (2 mmHg)

Freezing point: ≈ 13–15°C

Solubility: soluble in acetone, chloroform, ethanol, ethyl acetate, mineral oil, propan-2-ol, silicone oils, vegetable oils, and aliphatic and aromatic hydrocarbons; practically insoluble in glycerin, glycols, and water.

Surface tension: ≈ 29 mN/m for *Tegosoft P* at 25°C

Viscosity (dynamic): 5–10 mPa s (5–10 cP) at 25°C

11 Stability and Storage Conditions

Isopropyl palmitate is resistant to oxidation and hydrolysis and does not become rancid. It should be stored in a well-closed container, above 16°C, and protected from light.

12 Incompatibilities

See Isopropyl Myristate.

13 Method of Manufacture

Isopropyl palmitate is prepared by the reaction of palmitic acid with propan-2-ol in the presence of an acid catalyst. A high-purity material is also commercially available, which is produced by enzymatic esterification at low temperatures.

14 Safety

Isopropyl palmitate is widely used in cosmetics and topical pharmaceutical formulations, and is generally regarded as a relatively nontoxic and nonirritant material.⁽²⁻⁴⁾

LD₅₀ (mouse, IP): 0.1 g/kg⁽⁵⁾

15 Handling Precautions

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

16 Regulatory Status

Included in the FDA Inactive Ingredients Guide (topical and transdermal preparations). Used in nonparenteral medicines licensed in the UK.

17 Related Substances

Isopropyl myristate.

18 Comments

The EINECS number for isopropyl palmitate is 205-571-1.

19 Specific References

- 1 Mollee H, De Vrind J, De Vringer T. Stable reversed vesicles in oil: characterization studies and encapsulation of model compounds. *J Pharm Sci* 2000; 89(7): 930-939.
- 2 Frosch PJ, Kligman AM. The chamber-scarification test for irritancy. *Contact Dermatitis* 1976; 2: 314-324.
- 3 Guillot JP, Martini MC, Giauffret JY. Safety evaluation of cosmetic raw materials. *J Soc Cosmet Chem* 1977; 28: 377-393.
- 4 Opdyke DL, Letizia C. Monographs on fragrance raw materials. *Food Cosmet Toxicol* 1982; 20(Suppl.): 633-852.
- 5 Lewis RJ, ed. *Sax's Dangerous Properties of Industrial Materials*, 10th edn. New York: Wiley, 2000; 2168.

20 General References

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21 Author

AK Taylor.

22 Date of Revision

16 August 2002.