

# Isopropyl Myristate

## 1 Nonproprietary Names

BP: Isopropyl Myristate  
PhEur: Isopropyl Myristate  
USP-NF: Isopropyl Myristate

## 2 Synonyms

*Crodamol IPM; Dermol IPM; Estol IPM; Exceparl IPM; IPM; isopropyl ester of myristic acid; isopropylis myristas; isopropyl tetradecanoate; Kessco IPM 95; Lexol IPM-NF; Liponate IPM; myristic acid isopropyl ester; Rita IPM; Stelliesters IPM; Stepan IPM; Tegosoft M; tetradecanoic acid, 1-methylethyl ester; Waglinol 6014; Wickenol 101.*

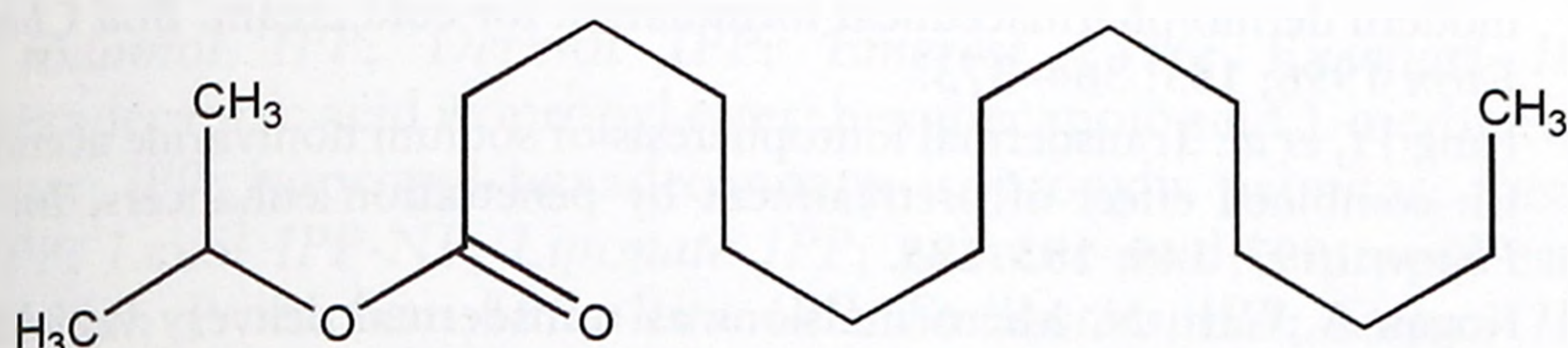
## 3 Chemical Name and CAS Registry Number

1-Methylethyl tetradecanoate [110-27-0]

## 4 Empirical Formula and Molecular Weight

$C_{17}H_{34}O_2$  270.5

## 5 Structural Formula



## 6 Functional Category

Emollient; oleaginous vehicle; penetration enhancer; solvent; transdermal delivery component.

## 7 Applications in Pharmaceutical Formulation or Technology

Isopropyl myristate is a nongreasy emollient that is absorbed readily by the skin. It is mainly used as a component of semisolid bases and as a solvent for many substances applied topically. Applications in topical pharmaceutical formulations include creams, lotions, sprays,<sup>(1)</sup> otic suspensions, and vaginal creams; see Table I.

Isopropyl myristate is used as a penetration enhancer for transdermal formulations.<sup>(1)</sup> For example, it is a self-emulsifying component of a proposed cold cream formula that is suitable for use as a vehicle for drugs or dermatological actives,<sup>(2)</sup> and it has also been used in conjunction with therapeutic ultrasound and iontophoresis.<sup>(3)</sup>

Isopropyl myristate has been used in a water-oil gel prolonged-release emulsion and in various microemulsions.<sup>(4-6)</sup> It has also been investigated for use in lipid-based oral dosage formulations<sup>(7,8)</sup> and nanoparticulate drug delivery systems.<sup>(9)</sup> Such microemulsions and nanoformulations may increase bioavailability in oral, topical, and transdermal applications.

Isopropyl myristate has also been investigated in the production of microspheres in controlled drug release systems and has been found to significantly increase the release of drug from etoposide-loaded microspheres.<sup>(10)</sup>

## 8 Description

Isopropyl myristate occurs as a clear, colorless, practically odorless liquid of low viscosity that congeals at about 5°C. It consists of

esters of propan-2-ol and saturated high molecular weight fatty acids, principally myristic acid.

**Table I:** Uses of isopropyl myristate.

Use	Concentration (%)
Detergent	0.003–0.03
Otic suspension	0.024
Perfumes	0.5–2.0
Microemulsions	<50
Soap	0.03–0.3
Topical aerosols	2.0–98.0
Topical creams and lotions	1.0–10.0

## 9 Pharmacopeial Specifications

See Table II.

**Table II:** Pharmacopeial specifications for isopropyl myristate.

Test	PhEur 9.2	USP 40–NF 35 S1
Identification	+	+
Characters	+	–
Appearance of solution	+	–
Relative density	≈0.853	0.846–0.854
Refractive index	1.434–1.437	1.432–1.436
Residue on ignition	≤0.1%	≤0.1%
Acid value	≤1.0	≤1.0
Saponification value	202–212	202–212
Iodine value	≤1.0	≤1.0
Viscosity	5–6 mPa s	–
Water	≤0.1%	–
Assay (as $C_{17}H_{34}O_2$ )	≥90.0%	≥90.0%

## 10 Typical Properties

**Boiling point** 140.2°C at 266 Pa (2 mmHg); 192.6°C at 2.67 kPa (20 mmHg) with decomposition at 208°C

**Flash point** 153.5°C (closed cup)

**Freezing point** ≈5°C

**Solubility** Soluble in acetone, chloroform, ethanol (95%), ethyl acetate, fats, fatty alcohols, fixed oils, liquid hydrocarbons, toluene, and waxes. Dissolves many waxes, cholesterol, or lanolin. Practically insoluble in glycerin, glycols, and water.

### Spectroscopy

IR spectrum see Figure 1.

Raman spectrum see Figure 2.

**Viscosity (dynamic)** 5–7 mPa s (5–7 cP) at 25°C

## 11 Stability and Storage Conditions

Isopropyl myristate is resistant to oxidation and hydrolysis and does not become rancid. It should be stored in a well-closed container in a cool, dry place and protected from light.

## 12 Incompatibilities

When isopropyl myristate comes into contact with rubber, there is a drop in viscosity with concomitant swelling and partial dissolution of the rubber; contact with plastics, e.g. nylon and polyethylene, results in swelling. Isopropyl myristate is incompatible with hard