

Sunflower Oil

1 Nonproprietary Names

BP: Sunflower oil, refined
PhEur: Helianthi annui oleum raffinatum

2 Synonyms

Huile de tournesol; oleum helianthi; sunflowerseed oil.

3 Chemical Name and CAS Registry Number

Sunflower oil [8001-21-6]

4 Empirical Formula Molecular Weight

See Section 5.

5 Structural Formula

Sunflower oil is classified as an oleic–linoleic acid oil. Its composition includes linoleic acid (66%), oleic acid (21.3%), palmitic acid (6.4%), arachidic acid (4.0%), stearic acid (1.3%), and behenic acid (0.8%).

The PhEur 2002 describes sunflower oil as the refined fatty oil obtained from the seeds of *Helianthus annuus* C. by mechanical expression or by extraction. A suitable antioxidant may be added.

6 Functional Category

Diluent; emollient; emulsifying agent; solvent; tablet binder.

7 Applications in Pharmaceutical Formulation or Technology

Sunflower oil is widely used as an edible oil, primarily in oleomargarine. It is also used extensively in cosmetics and pharmaceutical formulations.

Therapeutically, sunflower oil is used to provide energy and essential fatty acids for parental nutrition. Studies have shown that sunflower oil may be used in intramuscular injections without inducing tissue damage.⁽¹⁾

8 Description

Sunflower oil occurs as a clear, light yellow-colored liquid with a bland, agreeable taste.

9 Pharmacopeial Specifications

See Table I.

Table I: Pharmacopeial specifications for sunflower oil.

Test	PhEur 2002
Identification	+
Characters	+
Acid value	≤ 0.5
Peroxide value	≤ 10.0
Unsaponifiable matter	≤ 1.5%
Alkaline impurities	+
Composition of fatty acids	+
Palmitic acid	4.0–9.0%
Stearic acid	1.0–7.0%
Oleic acid	14.0–40.0%
Linoleic acid	48.0–74.0%

10 Typical Properties

Boiling point: 40–60°C

Density: 0.915–0.919

Hydroxyl value: 14–16

Iodine number: 125–140

Melting point: –18°C

Refractive index:

$n_D^{25} = 1.472–1.474$

$n_D^{30} = 1.466–1.468$

Saponification number: 188–194

Solubility: miscible with benzene, chloroform, carbon tetrachloride, diethyl ether, and light petroleum; practically insoluble in ethanol (95%) and water.

11 Stability and Storage Conditions

Sunflower oil should be stored in an airtight, well-filled container, protected from light. Stability may be improved by the addition of an antioxidant such as butylated hydroxytoluene.

12 Incompatibilities

The oxidative stability of sunflower oil is reduced in the presence of iron oxides and zinc oxide.⁽²⁾

Sunflower oil forms a 'skin' after being exposed to air for 2–3 weeks.

13 Method of Manufacture

Sunflower oil is obtained from the fruits and seeds (achenes) of the sunflower, *Helianthus annuus* (Compositae), by mechanical means or by extraction.

14 Safety

Sunflower oil is widely used in food products and on its own as an edible oil. It is also used extensively in cosmetics and topical pharmaceutical formulations and is generally regarded as a relatively nontoxic and nonirritant material.

15 Handling Precautions

Observe normal precautions appropriate to the circumstances and quantity of material handled. When heated to decomposition, sunflower oil emits acrid smoke and irritating fumes.

16 Regulatory Status

GRAS listed. Included in nonparenteral medicines licensed in the UK.

17 Related Substances

Corn oil; cottonseed oil; peanut oil; sesame oil; soybean oil.

18 Comments

High oleic acid content sunflower oil with good oxidative stability and emollient properties is commercially available for use in cosmetic formulations.⁽³⁾ Sunflower oil with marked oxidative stability is particularly suitable for the manufacture of sunscreen agents.⁽⁴⁾

Sunflower oil should be labeled to indicate the name and concentration of any antioxidant added, and also whether the oil was obtained by mechanical expression or extraction.

The EINECS number for sunflower oil is 232-273-9.

19 Specific References

- 1 Vinardell MP, Vives MA. Plasma creatine kinase activity after intramuscular injection of oily vehicles in rabbits. *Pharm Pharmacol Lett* 1996; 6(2): 54-55.
- 2 Brown JH, Arquette DJ, Kleiman R, *et al.* Oxidative stability of botanical emollients. *Cosmet Toilet* 1997; 112(7): 87-90, 92, 94, 96-98.
- 3 Arquette DJ, Cummings M, Dwyer K, *et al.* A natural oil made to last. *Cosmet Toilet* 1997; 112(1): 67-72.
- 4 Arquette DJ, Brown J, Dwyer K, Reinhardt J. Oils and fats: place in the sun. *Soap Perfum Cosmet* 1994; 67(Nov): 49, 51.

20 General References

—

21 Authors

SC Owen, PJ Sheskey.

22 Date of Revision

16 September 2002.