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Orange Oil

DEFINITION

Orange Oil is the volatile oil obtained by expression from the fresh peel of the ripe fruit of *Citrus sinensis* (L.) Osbeck (Fam. Rutaceae). The total aldehyde content, calculated as decanal ($C_{10}H_{20}O$), is NLT 1.2% and NMT 2.5%. It may contain a suitable antioxidant.

[Note—Do not use Orange Oil that has a terebinthine odor.]

ASSAY

• **Total Aldehyde Content**

Reagent solution: Dissolve 4.5 g of hydroxylamine hydrochloride in 13 mL of water. Add 85 mL of tertiary butyl alcohol, mix, and adjust with 0.5 N potassium hydroxide to a pH of 3.4.

Sample: 5 mL of Orange Oil, accurately weighed

Analysis: Pipet 50 mL of the *Reagent solution* into a conical flask containing the *Sample*. Insert the stopper in the flask, and allow to stand at room temperature for 30 min, with occasional shaking. Titrate the liberated hydrochloric acid with 0.5 N alcoholic potassium hydroxide VS to a pH of 3.4. Each mL of 0.5 N alcoholic potassium hydroxide consumed in the titration is equivalent to 78.13 mg of total aldehydes, calculated as decanal ($C_{10}H_{20}O$).

Acceptance criteria: 1.2%–2.5%

SPECIFIC TESTS

• **Specific Gravity ⟨841⟩:** 0.842–0.846

• **Optical Rotation, *Angular Rotation* ⟨781A⟩:** +94° to +99°

• **Refractive Index ⟨831⟩:** 1.472–1.474 at 20°

• **Ultraviolet Absorbance**

Sample solution: 250 mg of Oil in 100 mL of alcohol

Blank: Alcohol

Instrumental conditions

(See *Ultraviolet-Visible Spectroscopy ⟨857⟩*.)

Mode: UV-Vis

Wavelength range: 260–400 nm

Analysis: Record the spectrum in 1-cm cell. Determine the absorbance at the wavelength of maximum absorbance at 330 nm, using the line drawn tangent to the curves appearing as minima in the spectrum in wavelength regions above and below the maximum wavelength as the baseline.

Acceptance criteria: The absorbance, calculated on the basis of a 250-mg specimen, is NLT 0.130 for California-type Orange Oil or NLT 0.240 for Florida-type Orange Oil.

• **Foreign Oils**

Analysis: Place 50 mL of Oil in a four-bulb Ladenburg flask having the following dimensions: the lower or main bulb is about 6 cm in diameter, and the smaller condensing bulbs are about 3.5, 3.0, and 2.5 cm in diameter; the distance from the bottom of the flask to the side-arm is about 20 cm. Distill Oil at a rate of 1 drop/s until the distillate measures 5 mL.

Acceptance criteria: The angular rotation of the distillate does not differ from that of the original Oil by more than 2°, and the refractive index at 20° is 0.001–0.002 lower than that of the original Oil.

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in well-filled, tight containers, and avoid exposure to excessive heat.

• **Labeling:** The label states the Latin binomial and, following the official name, the part of the plant source from which the article was derived. Label it also to indicate whether it is California-type or Florida-type Orange Oil. The label indicates that Oil is not to be used if it has a terebinthine odor.

Auxiliary Information - Please check for your question in the FAQs before contacting USP.

Topic/Question	Contact	Expert Committee
ORANGE OIL	Nam-Cheol Kim Scientific Liaison	BDSHM2020 Botanical Dietary Supplements and Herbal Medicines
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