

β -apo-8'-CAROTENAL

Prepared at the 28th JECFA (1984), published in FNP 31/1 (1984) and in FNP 52 (1992). Metals and arsenic specifications revised at the 63rd JECFA (2004). A group ADI of 0-5 mg/kg bw expressed as the sum of the carotenoids: β -carotene, β -apo-8'-carotenal, was established at the 18th JECFA (1974).

SYNONYMS

CI Food Orange 6; CI (1975) No. 40820, INS No. 160e

DEFINITION

Specifications apply to predominantly all trans (Z) isomer of β -apo-8'-carotenal together with minor amounts of other carotenoids; diluted and stabilized forms are prepared from β -apo-8'-carotenal meeting these specifications and include solutions or suspensions of β -apo-8'-carotenal in edible fats or oils, emulsions and water dispersible powders; these preparations may have different cis/trans isomer ratios; the analytical methods described for the parent colour are not necessarily suitable for the assay of or determination of impurities in the stabilized forms (appropriate methods should be available from the manufacturer).

Chemical names

β -Apo-8'-carotenal, 8'-apo- β -carotene-al

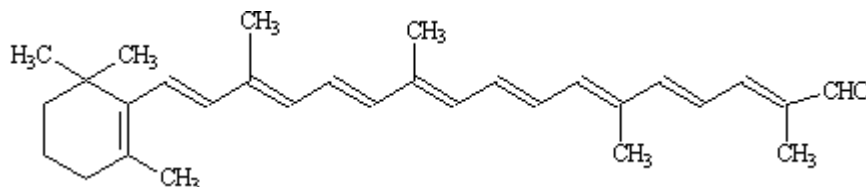
C.A.S. number

1107-26-2

Chemical formula

C₃₀H₄₀O

Structural formula



Formula weight

416.65

Assay

Not less than 96% of total colouring matters

DESCRIPTION

Deep violet crystals with metallic lustre or crystalline powder; sensitive to oxygen and light and should therefore be kept in a light-resistant container under inert gas.

FUNCTIONAL USES Colour

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4)

Insoluble in water, slightly soluble in ethanol, sparingly soluble in vegetable oils, soluble in chloroform.

Spectrophotometry

Determine the absorbance of the sample solution (See Method of Assay) at 461 nm and 488 nm. The ratio A_{488}/A_{461} is between 0.80 and 0.84.

Test for carotenoid

The colour of a solution of the sample in acetone disappears after successive additions of a 5% solution of sodium nitrite and 1 N sulfuric acid.

Carr-Price reaction A solution of the sample in chloroform turns blue on addition of an excess of Carr-Price reagent TS.

PURITY

Sulfated ash (Vol. 4) Not more than 0.1%
Test 2 g of the sample (Method I)

Lead (Vol. 4) Not more than 2 mg/kg
Determine using an atomic absorption technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the method described in Volume 4, "Instrumental Methods."

Subsidiary colouring matter Not more than 3% of total colouring matters
See description under TESTS

TESTS

PURITY TESTS

Subsidiary colouring matter Dissolve about 80 mg of sample in 100 ml chloroform. Apply 400 µl of this solution as a streak 2 cm from the bottom of a TLC-plate (Silicagel 0.25 mm). Pretreat the thin-layer plate by soaking in a tank with 3% KOH in methanol so that it is completely wetted. Then dry the plate for 5 min in the air and activate for 1 h at 110° in an oven. Let cool over CaCl₂ and keep in a desiccator over CaCl₂.

Immediately after applying the carotenoid solution to the plate, develop the chromatogram with n-hexane/chloroform/ethylacetate (70+20+10) in a saturated chamber suitably protected from light, until the solvent front has moved 10 cm above the initial streak. Remove the plate, allow the main part of the solvent to evaporate at room temperature and mark the principal band as well as the bands corresponding to other carotenoids. Remove the silicagel adsorbent that contains the principal band, transfer it to a glass-stoppered 100 ml centrifuge tube and add 40.0 ml chloroform (solution 1). Separately remove the silica gel of the combined bands corresponding to the other carotenoids, transfer it to a glass-stoppered, 50 ml centrifuge tube and add 20.0 ml chloroform (solution 2). Shake the centrifuge tubes by mechanical means for 10 min and centrifuge for 5 min. Dilute 10.0 ml of Solution 1 to 50.0 ml with chloroform (solution 3).

Determine, with a suitable spectrophotometer, the absorbances of Solutions 2 and 3 in 1-cm cells at the wavelength maximum in chloroform at about 474 nm, using chloroform as a blank.

Calculation

Carotenoids other than β-apo-8'-carotenal

$$\frac{A_2 \times 10}{A_3}$$

where

A_2 = absorbance of Solution 2

A_3 = absorbance of Solution 3

**METHOD OF
ASSAY**

Weigh accurately about 80 mg of the sample and proceed as directed under *Total Content by Spectrophotometry* (see Volume 4)

Absorptivity (a) = 2640

Approximate wavelength of maximum absorption = 461 nm.