CITRANAXANTHIN

Prepared at the 31st JECFA (1987), published in FNP 38 (1988) and in FNP 52 (1992). Metals and arsenic specifications revised at the 63rd JECFA (2004). No ADI was allocated at the 31st JECFA (1987)

DEFINITION These specifications apply to predominantly all trans (z) isomer of citranaxanthin together with minor amounts of other carotenoids; diluted and stabilized forms are prepared from citranaxanthin meeting these specifications and include solutions or suspensions of citranaxanthin in edible fats or oils, emulsions and water dispersible powders; these preparations may have different cis/trans isomer ratios.

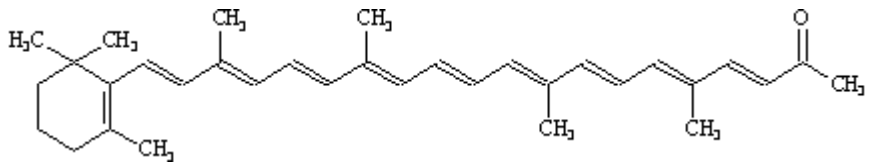
These specifications define only synthetic citranaxanthin. The Committee was aware of naturally occurring citranaxanthin but had no indication of a commercial available food colour obtained from natural sources.
The analytical methods described for the parent colour are not necessarily suitable for the assay of or determination of impurities in the stabilized forms. (Appropriate methods should be available from the manufacturer).

Chemical names: Citranaxanthin, 6'-methyl-6'-apo- ß-carotene-6'-one, 5',6'-dehydro-5'-apo-18'-nor- ß-caroten-6'one

C.A.S. number: 3604-90-8

Chemical formula: $C_{33}H_{44}0$

Structural formula:



Formula weight: 456.71

Assay: Not less than 96% total colouring matters (expressed as citranaxanthin)

DESCRIPTION Deep violet crystals; 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; very slightly soluble in ethanol; slightly soluble in vegetable oils; soluble in chloroform

Spectrophotometry: A solution of citranaxanthin in chloroform has an absorbance maximum between 478 and 482 nm.

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 1N 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)

Subsidiary colouring matters — Not more than 4% of total colouring matters are carotenoids other than citranaxanthin
See description under TESTS

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.”

TESTS

PURITY TESTS

Subsidiary colouring matters — Dissolve about 80 mg of sample in 100 ml chloroform. Apply 400 µl of this solution as 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% potassium hydroxide in methanol so that it is completely wetted. Then dry the plate for 5 min in the air and activate for 1 h at 110º in an oven. Let cool over $CaCl_2$ and keep in a desiccator over $CaCl_2$.

Immediately develop the chromatogram with a solvent mixture of 95 parts dichloromethane and 5 parts diethyl ether in a saturated chamber, suitably protected from light, until the solvent front has moved 15 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).

Remove the silicagel adsorbent containing 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 maximum wavelength in chloroform, about 482 nm, using chloroform as blank.
Calculate the percentage of carotenoids other than citranaxanthin (%) from

$$\frac{A_2 \times 100}{10 A_3 + A_2}$$

where
A_2 = absorbance of solution 2
A_3 = absorbance of solution 3

METHOD OF ASSAY

Proceed as directed under *Total Content by Spectrophotometry* (see Volume 4) using the following conditions:
W = 0,08 g
$V_1 = V_2 = V_3$ = 100 ml
$v_1 = v_2$ = 5 ml
$A^{1\%}_{1\ cm}$ = 2680
$lambda_{max}$ = about 473 nm