

COCHINEAL EXTRACT

Prepared at the 55th JECFA (2000), published in FNP 52 Add 8 (2000) superseding specifications prepared at the 51st JECFA (1998), published in FNP 52 Add 6 (1998). No ADI allocated at the 21st JECFA in 1977.

SYNONYMS

CI Natural Red 4, CI (1975) No. 75470; INS No. 120

DEFINITION

Cochineal consists of the dried bodies of the female insect *Dactylopius coccus* Costa; Cochineal extract is the concentrated solution obtained after removing the alcohol (ethanol and/or methanol) from an aqueous, aqueous alcoholic or alcoholic extract of cochineal; the colouring principle is chiefly carminic acid; commercial products may also contain proteinaceous material derived from the source insect.

In commercial products the colouring principle may also be present in association with ammonium, potassium or sodium cations, singly or in combination, and these cations may also be present in excess.

Chemical names

7-beta-D-glucopyranosyl-3,5,6,8-tetrahydroxy-1-methyl-9,10-dioxoanthracene-2-carboxylic acid

C.A.S. number

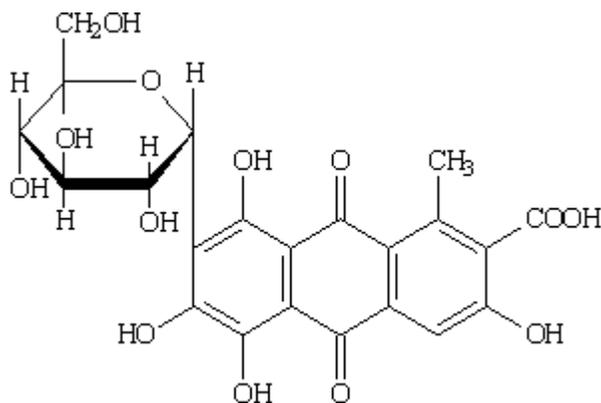
1343-78-8 (cochineal)
1260-17-9 (carminic acid)

Chemical formula

C₂₂H₂₀O₁₃ (Carminic acid)

Structural formula

Carminic acid:



Formula weight

Carminic acid: 492.39

Assay

Not less than 2.0% C₂₂H₂₀O₁₃

DESCRIPTION

Dark red liquid

FUNCTIONAL USES

Colour

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4)

Freely soluble in water

Colour reactions

Make a solution of the sample slightly alkaline by adding 1 drop of 10% sodium hydroxide or potassium hydroxide solution. A violet colour is produced.

Add a small sodium dithionite ($\text{Na}_2\text{S}_2\text{O}_4$) crystal to acid, neutral or alkaline solutions of the sample. The solutions are not decolourized.

Dry a small quantity of the sample in a porcelain dish. Cool thoroughly and treat the dry residue with 1 or 2 drops of cold sulfuric acid TS. No colour change occurs.

Acidify a dispersion of the sample in water with 1/3 volume of hydrochloric acid TS and shake it with amyl alcohol. Wash the amyl alcohol solution 2-4 times with an equal volume of water to remove hydrochloric acid. Dilute the amyl alcohol solution with 1-2 volumes of petroleum ether (40-60°) and shake with a few small portions of water to remove colour. Add, dropwise, 5% uranium acetate, shaking thoroughly after each addition. A characteristic emerald-green colour is produced.

PURITY

Protein (Vol. 4)

Not more than 2.2%

Proceed as directed under Nitrogen Determination (non-ammonia N x 6.25)

Ethanol (Vol. 4)

Not more than 150 mg/kg

Proceed as directed under Residual solvent

Methanol (Vol.4)

Not more than 150 mg/kg

Proceed as directed under Residual solvent

Microbiological criteria
(Vol. 4)

Salmonella: Negative per test

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."

METHOD OF ASSAY

Weigh accurately about 1 g of the sample, dissolve in 30 ml of boiling 2N hydrochloric acid, and cool. Transfer quantitatively to a 1000 ml volumetric flask, dilute to volume with water, and mix. Determine the absorbance of the solution in a 1 cm cell at the wavelength of maximum absorbance (about 494 nm) using water as the blank. Calculate the percentage of carminic acid in the sample using the formula:

$$\frac{100 \times A \times 100}{1.39 \times W}$$

where

A = absorbance of the sample solution;

W = weight, in mg, of the sample taken; and

1.39 = absorbance of a solution of carminic acid having a concentration of 100

mg per 1000 ml

If the measured absorbance is not within the range 0.650 to 0.750, prepare another sample and adjust the weight accordingly.