

FAST GREEN FCF

Prepared at the 30th JECFA (1986), published in the *Combined Compendium of Food Additive Specifications, FAO JECFA Monographs 1 (2005)*. Corrected at the 69th JECFA (2008). An ADI of 0-25 mg/kg bw was established at 30th JECFA (1986).

SYNONYMS

CI Food Green 3, FD&C Green 3, CI (1975) No. 42053, INS No. 143

DEFINITION

Consists essentially of disodium 3-[N-ethyl-N-[4-[[4-[N-ethyl-N-(3-sulfonatobenzyl)amino]phenyl](4-hydroxy-2-sulfonatophenyl)methylene]-2,5-cyclohexadien-1-ylidene]ammoniomethyl]benzenesulfonate and isomers and subsidiary colouring matters together with water, sodium chloride and/or sodium sulfate as the principal uncoloured components. May be converted to the corresponding aluminium lake in which case only the *General Specifications for Aluminium Lakes of Colouring Matters* apply.

Chemical names

Disodium 3-[N-ethyl-N-[4-[[4-[N-ethyl-N-(3-sulfonatobenzyl) amino] phenyl](4-hydroxy-2-sulfonatophenyl)methylene]-2,5-cyclohexadien-1-ylidene] ammoniomethyl]-benzenesulfonate;
Inner disodium salt of N-ethyl-N-[4[[4-ethyl[(3-sulfophenyl)methyl]amino]phenyl](4-hydroxy-2-sulfophenyl) methylene]-2,5-cyclohexadien-1-ylidene]-3-sulfobenzene-methanaminium hydroxide

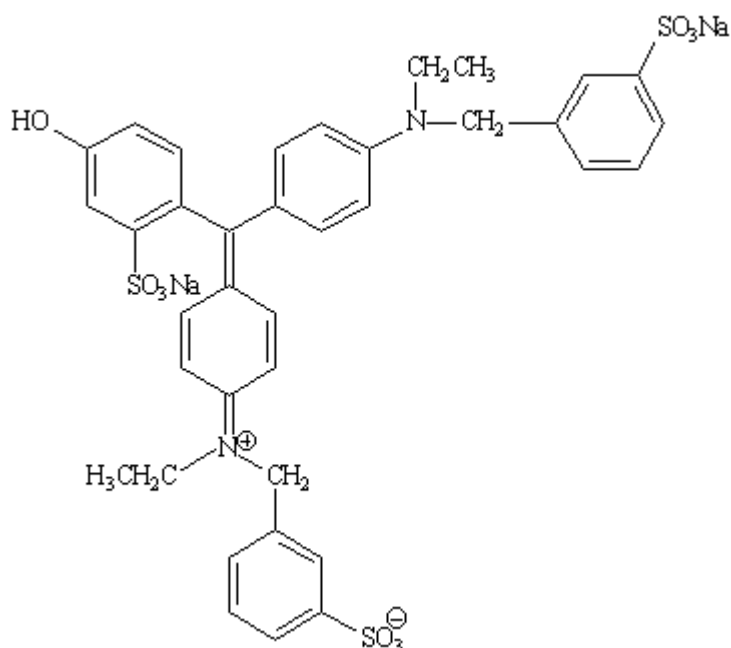
C.A.S. number

2353-43-9

Chemical formula

$C_{37}H_{34}N_2Na_2O_{10}S_3$

Structural formula



Formula weight

808.86

Assay Not less than 85% total colouring matter

DESCRIPTION Red to brown-violet powder or crystals

FUNCTIONAL USES Colour

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4) Soluble in water; sparingly soluble in ethanol

Identification of colouring matters (Vol. 4) Passes test

PURITY

Loss on drying at 135° (Vol. 4) Not more than 15% together with chloride and sulfate calculated as sodium salts

Water insoluble matter (Vol. 4) Not more than 0.2%

Chromium (Vol. 4) Not more than 50 mg/kg

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 matters Not more than 6%
See description under TESTS

Organic compounds other than colouring matters (Vol. 4) Not more than 0.5%, sum of 2-, 3-, and 4-Formylbenzenesulfonic acids, sodium salts
Not more than 0.3%, sum of 3- and 4-[N-Ethyl-N-(4-sulfophenyl)amino]methylbenzenesulfonic acid, disodium salts
Not more than 0.5% of 2-Formyl-5-hydroxybenzenesulfonic acid, sodium salt

Proceed as directed under *Column Chromatography*, using, for example, the following absorptivities:

3-formylbenzenesulfonic acid: $0.495 \text{ mg L}^{-1} \text{ cm}^{-1}$ at 246 nm in dilute HCl
3-[(ethyl)(4-sulfophenyl)amino]methylbenzenesulfonic acid: $0.078 \text{ mg L}^{-1} \text{ cm}^{-1}$ at 277 nm in dilute ammonia
2-formyl-5-hydroxybenzenesulfonic acid: $0.080 \text{ mg L}^{-1} \text{ cm}^{-1}$ at 335 nm in dilute ammonia

Leuco base (Vol. 4) Not more than 5.0%
Weigh accurately 130±5 mg sample and proceed as directed under *Leuco Base in Sulfonated Triarylmethane Colours*
Absorptivity (a) = 0.156 mg L⁻¹ cm⁻¹ at approx. 625 nm
Ratio = 0.971

Unulfonated primary aromatic amines (Vol. 4) Not more than 0.01% calculated as aniline

Ether extractable matter (Vol. 4) Not more than 0.4%

TESTS

PURITY TESTS

Subsidiary colouring matters Prepare a 1% solution of the colour. By means of a syringe spot as a band 1 mg of the colour on an 20 x 20 cm silica gel *thin layer chromatographic plate*. Allow the plate to dry about 20 min in the dark before placing it in a chromatographic tank containing the following developing solution: acetonitrile/isoamyl alcohol/methyl ethyl ketone/water/ammonia (50/50/15/10/5 by volume). Develop the plate until the solvent front is near the top of the plate. Remove the plate and allow it to dry. The subsidiary colours will appear in the following positions: the two top bands are the lower sulfonated subsidiary colours followed by the isometric and the main band or fast Green FCF near the bottom of the plate. Scrape off all the bands above the isometric colour. Extract the colour from the silica gel with ethyl alcohol. Filter through a sintered glass funnel and examine spectrophotometrically. The Standard absorptivity of the lower subsidiary colour is 0.126 mgL⁻¹cm⁻¹.

NOTE: In the calculation of the subsidiary colour, it is assumed that its absorptivity at its peak is the same as that of the parent compound at its peak. Standard solutions must be prepared and their absorptivities measured within 1 h. Spectrophotometric measurements of the extracted subsidiary colours must be made as promptly as possible.

METHOD OF ASSAY Proceed as directed under *Total Content by Titration with Titanous Chloride* (see Volume 4) using the following:
Weight of sample: 1.9 - 2.0 g
Buffer: 15 g sodium hydrogen tartrate
Weight (D) of colouring matters equivalent to
1.00 ml 0.1 N TiCl₃: 40.45 mg