QUINOLINE YELLOW

Prepared at the 28th JECFA (1984), published in FNP 31/1 (1984) and in FNP 52 (1992). Metals and arsenic specifications revised at the 59th JECFA (2002). An ADI of 0-10 mg/kg bw was established at the 28th JECFA (1984)

SYNONYMS CI Food Yellow 13, CI (1975) No. 47005, INS No. 104

DEFINITION Prepared by sulfonating 2-(2-quinolyl)-1,3-indandione or a mixture containing about two-thirds 2-(2-quinolyl)-1,3-indandione and one-third 2-[2-(6-methyl-quinolyl)]1,3-indandione; consists essentially of sodium salts of a mixture of disulfonates (principally), monosulfonates and trisulfonates of the above compounds and subsidiary colouring matters together with sodium chloride and/or sodium sulfate as the principal uncoloured components.

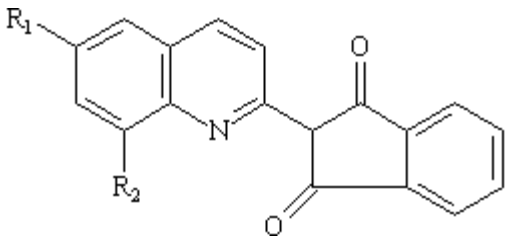
May be converted to the corresponding aluminium lake in which case only the *General Specifications for Aluminium Lakes of Colouring Matters* apply.

Chemical names Disodium 2-(1,3-dioxo-2-indanyl)-6,8-quinolinesulfates; disodium 2-(2-quinolyl)-indan-1,3-dionedisulfonates (principal component)
Chemical formula

C.A.S. number 8004-72-0 (Unmethylated disulfonic acids)

Chemical formula $C_{18}H_9NNa_2O_8S_2$ (principal component)

Structural formula (Principal component)



6 salt: $R_1 = SO_3Na$, $R_2 = H$
8 salt: R_1, $R_2 = SO_3H$

Formula weight 477.38 (Principal components)

Assay Not less than 70% total colouring matters. Quinoline Yellow prepared from 2-(2-quinolyl)-1,3-indandione (only) shall have the following composition: Of the total colouring matters present:
- not less than 80% shall be disodium 2-(2-quinolyl)-indan-1,3-dionedisulfonates;
- not more than 15% shall be sodium 2-(2-quinolyl)-indan-1,3-dionemonosulfonates;
- not more than 7% shall be trisodium 2-(2-quinolyl)-indan-1,3-

dionetrisulfonate

DESCRIPTION Yellow powder or granules

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 30% together with chloride and sulfate calculated as sodium salts
Water insoluble matter (Vol. 4)	Not more than 0.2%
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.”
Zinc (Vol. 4)	Not more than 50 mg/kg
Subsidiary colouring matters	Not more than 4 mg/kg: of 2-(2-quinolyl)-1,3-indandione and 2-[2-(6-methylquinolyl)]-1,3-indandione See description under TEST
Organic compounds other than colouring matters	Not more than 0.5%, sum of 2-methylquinoline, 2-methylquinolinesulfonic acid, phthalic acid, 2,6-dimethylquinoline, 2,6-dimethylquinolinesulfonic acid (the two last compounds refer only to quinoline yellow prepared from the mixture of 2-(2-quinolyl)-indan-1,3-dione and 2-[2-(6-methylquinolyl)]-1,3-indiandone) See description under TESTS
Unsulfonated primary aromatic amines (Vol. 4)	Not more than 0.01% calculated as aniline
Ether extractable matter (Vol. 4)	Not more than 0.2%

TESTS

PURITY TESTS

Subsidiary colouring matters (Vol. 4)

Limit test for 2-(2-quinolyl)-1,3-indandione and 2-[2-(6-methyl-quinolyl)]-1,3-indandione

Use the apparatus and ether quality described in *Ether Extractable Matter* and carry out an extraction following the details given there under. Wash the ether extract with two 25-ml portions of water. Evaporate the ether extract to about 5 ml and then transfer it to an oven at 105° to remove the remaining ether. Dissolve the residue in chloroform, and dilute the solution to exactly 10 ml. Determine the absorbance at the wavelength of maximum absorption (approximately 420 nm) using chloroform as the reference solution. The absorbance corresponding to the limit figure of 4 mg/kg 2-(2-quinolyl-1,3-indandione is 0.27. Any 2-[2-(6-methylquinolyl)]-1,3-indandione is assessed as 2-(2-quinolyl)-1,3-indandione.

Organic compounds other than colouring matters

Organic compounds other than colouring matters in Quinoline Yellow prepared from 2-(2-quinolyl)-1,3-indandione (only)

Determine by *liquid chromatography*, using the following conditions:
Instrument: High performance liquid chromatograph fitted with a gradient elution accessory.
Detector: A UV HPLC detector recording absorbances at 254 nm
Column: 250 x 4 nm, Nucleosil C_{18}, 7 µm
Solvent system:
A: Acetate Buffer pH 4.6: water (1:10) (Acetate Buffer is 1M NaOH:1 M acetic acid:water (5:10:35)
B: (A):methanol (20:80)
Sample concentration: 1% weight/volume in Solvent A
Gradient:

Min	%A	%B
0	100	0
15	65	35
20	50	50
25	0	100
36	0	100
42	100	0

Flow rate: 1 ml/min

METHOD OF ASSAY

Proceed as directed under *Total Content by Spectrophotometry* (see Volume 4)
Solvent: pH 7 phosphate buffer
Dilution of solution A: 10 ml to 250 ml
Absorptivity (a): 86.5
Approximate wavelength of maximum absorption: 415 nm

Determination of the percentages of di-, mono- and trisulfonates in Quinoline Yellow prepared from 2-(2-quinolyl)-1,3-indandione (only):
Use the HPLC conditions prescribed in the Determination of Organic Compounds other than Colouring Matters with a sample solution of concentration 0.05% in HPLC Solvent A in place of the sample solution of concentration 1%. Express the results as percentages of the Total colouring matters present.