भारतीय मानक **IS 1695 : 2024**

Indian Standard

सन्सेट येल्लो, एफसीएफ, खाद्य ग्रेड — विशिष्टि

(चौथा पुनरीक्षण)

Sunset Yellow, FCF, Food Grade — Specification

(Fourth Revision)

ICS 67.220.20

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

May 2024 **Price Group 7**

Food Additives Sectional Committee, FAD 08

FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Food Additives Sectional Committee had been approved by the Food and Agriculture Division Council.

This standard is one of the series of Indian Standards for edible synthetic colours permitted under the *Food Safety and Standards* (*Food product standards and Food Additives*) *Regulation*, 2011. This standard was first published in 1960 and revised in 1974, 1994 and 2014. The first revision of the standard was carried out in 1974 to bring it in line with the FAO/WHO specifications and also taking into account the indigenous data generated. In second revision the minimum requirement for total dye content was raised; the maximum requirement of loss on drying at 135 °C and chloride and sulphate expressed as sodium salt were decreased; and the limits for water insoluble matter and subsidiary dyes were made more stringent to align them with the International requirements. The third revision was carried out to align the specification in line with the latest revised Joint FAO/WHO expert committee on food additives (JECFA) specification on sunset yellow, food grade. Accordingly, the limits and test methods for Sudan I (1-phenylazo) — 2-naphthalenol) and unsulphonated primary aromatic amines were included; and the limit for lead was made more stringent.

In this revision, the following changes have been made:

a) The requirement for heavy metals has been removed as the limit of lead (contaminant in food colours) is already covered through the standard; and

b) The limits for mercury, copper, chromium, and cadmium have been incorporated.

Description

Common Name — Sunset yellow

Synonyms 1-phenylazo C.I. Food Yellow 3, Orange Yellow S; INS No.110

Colour of the 0.1 *Percent* (*m/v*) *Solution in Distilled Water* — Orange.

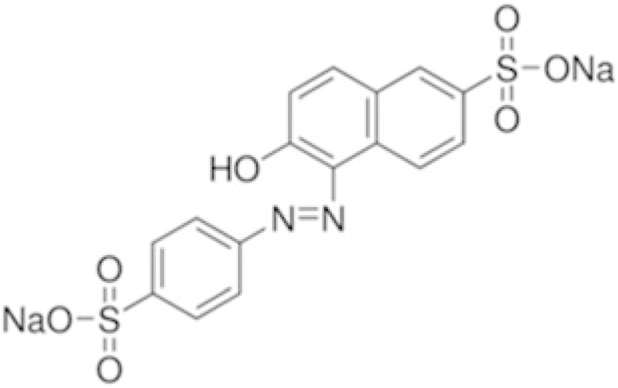
Colour Index Number (1975) — No. 15985.

Class — Monoazo.

Chemical Name — Principal component of Sunset Yellow is Disodium – 6 – hydroxyl – 5 – (4 – sulphonato phenylazo) – 2 – naphthalene - sulphonate.

Empirical Formula — $C_{16}H_{10}N_2Na_2O_7S_2$ (principal componenet)

Structural Formula —



(*Continue on third cover*)

Indian Standard

SUNSET YELLOW, FCF, FOOD GRADE — SPECIFICATION

(Fourth Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for sunset yellow, FCF, food grade.

2 REFERENCES

The standards given below contain provisions, which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards:

IS No.	*Title*
IS 1070 : 2023	Reagent grade water — Specification (*fourth revision*)
IS 1699 : 1995	Methods of sampling and test for food colours (*second revision*)
IS 2491 : 2013	Food hygiene — General principles — Code of practice (*third revision*)

3 REQUIREMENTS

3.1 Test for Colour

In water, neutral or acidic solutions of sunset yellow FCF are yellow-orange where as basic solutions are red-brown. When dissolved in concentrated sulphuric acid, the additive yields an orange solution that turns yellow when diluted with water.

3.2 The product shall be processed, packed, stored and distributed under hygienic conditions (*see* IS 2491).

3.3 The material shall also comply with the requirements given in Table 1.

4 PACKING

The material shall be packed in glass containers, metal containers, polyethylene containers, or cardboard containers suitably lined with polyethylene. Any other suitable containers may also be used, subject to agreement between the purchaser and the vendor.

5 MARKING

5.1 Each container shall be legibly and indelibly marked with the following information:

a) The words ‘Food Colour’;
b) Common name of the colour;
c) Chemical name of the colour;
d) Colour index number;
e) Date of manufacture;
f) Net quantity, in g or kg;
g) Batch or code number; and
h) Any other requirements as given under the *Legal metrology* (*Packaged Commodities*) *Rules*, 2011 and *Food Safety and Standards* (*Labelling and Display*) *Regulations*, 2020 framed thereunder.

5.2 BIS Certification Marking

The product may also be marked with the Standard Mark. The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

Representative samples of the material for tests shall be drawn and criteria for ascertaining conformity to the requirements of this standard shall be determined according to the method prescribed in IS 1699.

7 TESTS

Tests shall be carried out as prescribed in co1 (4) of Table 1.

8 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — ‘Pure chemicals’ shall mean chemicals that do not contain impurities which affect the results of analysis.

Table 1 Requirements for Sunset Yellow, FCF, Food Grade

(*Clauses* 3.3 *and* 7)

Sl No. (1)	Characteristic (2)	Requirements (3)	Method of Test, Ref to (4)
i)	Total dye content, corrected for sample dried at 105 °C ± 1°C for 2 h, percent by mass, *Min*	87.0	Annex A
ii)	Loss on drying at 135 °C, percent by mass, chlorides and sulphates expressed as sodium salt, percent by mass, *Max*	15.0	IS 1699
iii)	Water insoluble matter, percent by mass, *Max*	0.2	IS 1699
iv)	Combined ether experts, percent by mass, *Max*	0.2	IS 1699
v)	Subsidiary dyes:		
	a) lower sulphonated dyes including traces of orange II, percent by mass, *Max*	3.0	**B-1**
	b) colours other than trisodium 2-hydroxy-1-(4-sulphonatophenyl azo), naphthalene-3,6-disulphonate	2.0	**B-2**
vi)	Dye intermediates (organic compounds other than colouring matters), percent by mass, *Max*	0.5	Annex C
vii)	Unsulphonated primary aromatic amines, percent, *Max*	0.01	Annex D
viii)	Sudan I (1-(phenylazo)-2-naphthalenol), ppm, *Max*	1.0	Annex E
ix)	Lead, mg/kg, *Max*	2.0	IS 1699
x)	Arsenic, mg/kg, *Max*	3.0	IS 1699
xi)	Mercury, mg/kg, *Max*	1.0	IS 1699
xii)	Copper, mg/kg, *Max*	30.0	IS 1699
xiii)	Chromium, mg/kg, *Max*	50.0	IS 1699
xiv)	Cadmium, mg/kg, *Max*	1.0	IS 1699

ANNEX A

[*Table* 1, *Sl No.* (i)]

DETERMINATION OF TOTAL DYE CONTENT

A-1 GENERAL

Two methods, spectrophotometric method and the titanium trichloride method, have been specified. In case of dispute, spectrophotometric method shall be regarded as the reference method.

A-2 SPECTROPHOTOMETRIC METHOD

A-2.1 Apparatus

Suitable spectrophotometer with properly calibrated scales for both wave length and optical density. However, a suitable spectrocolorimetric may also be used after calibration against a spectrophotometer.

A-2.2 Procedure

Weigh accurately about 250 mg of the dye sample and dissolve with 0.1 N hydrochloric acid in a 250 ml volumetric flask, dilute this with the same solvent to make a final concentration of 1 mg/100 ml (approximately). Find out the optical density of this dilute solution, against 0.1 N hydrochloric acid as blank, at 482 nm, in a glass cell with 10.0 mm light path.

Simultaneously weigh accurately about 2 g of the dye-sample and dry this in an air-oven at 105 °C ± 1 °C for 2 h. Calculate the loss of mass on drying; from this data, calculate the dry mass of the sample (M) in the final solution taken for measurement of optical density.

A-2.3 Calculation

Total dye content of the sample, percent by mass =

$$\frac{OD \times 100}{M \times 543}$$

where

OD = optical density found;
M = dry mass, in g, of the sample in 100 ml solution; and
543 = $E^{1\%}$ 1 cm, 482 nm, for sunset yellow FCF, in 0.1 N hydrochloric acid.

A-3 TITANIUM CHLORIDE METHOD

The method given in IS 1699 shall be followed. The percentage of total dye content shall be determined using the following calculation:

1 ml of 0.1 N $TiCl_3$ = 0.011 36 g of sunset yellow.

ANNEX B

[*Table* 1, *Sl No.* (v)]

DETERMINATION OF SUBSIDIARY DYES

B-1 DETERMINATION OF LOWER SULPHONATED DYES INCLUDING TRACES OF ORANGE II

B-1.1 Procedure

The method given in IS 1699 using the conditions given below shall be followed:

a) *Developing solvent*: No. 4

b) *Height of ascent of solvent front*: approximately 17 cm

B-2 DETERMINATION OF COLOURS OTHER THAN TRISODIUM 2-HYDROXY-1-(4-SULPHONATOPHENYL AZO) NAPHTHALENE-3, 6-DISULPHONATE

B-2.1 Procedure

The method given in IS 1699 using the conditions given below shall be followed:

a) *Chromatography solvent*: 2-butanone : acetone : water : ammonia (specific gravity, 0.880) (700 : 300 : 300 : 2).

b) *Height of ascent of so1vent front* : approximately 17 cm

ANNEX C

[*Table* 1, *Sl No.* (vi)]

DETERMINATION OF DYE INTERMEDIATES (ORGANIC COMPOUNDS OTHER THAN COLOURING MATTERS)

C-1 GENERAL

Two methods, column chromatographic and ascending paper chromatographic method have been specified. In case of dispute, the column chromatographic method shall be regarded as the reference method.

C-2 METHOD I

C-2.1 Principle

Sunset yellow FCF is prepared by diazotization of aniline-4-sulphonic acid and the diazo so formed is coupled with 2-naphthol-6-sulphonic acid. These intermediates are determined by ascending paper chromatography.

C-2.2 Apparatus

C-2.2.1 *Chromatography Tank and Ancillary Equipment* — as given under IS 1699

C-2.2.2 *Microsyringe* — capable of 0.2 ml with a tolerance of ± 0.000 2 ml.

C-2.2.3 *Ultraviolet Lamp* — with a wavelength of 365.5 nm

C-2.2.4 *Filter Paper* — Whatman No. 1 or equivalent

C-2.3 Reagents

C-2.3.1 *Ammonium Hydroxide Solution* — specific gravity, 0.923

C-2.3.2 *Developing Solvent* — sodium chloride solution, 10 percent

C-2.3.3 *2-Naphthol-6-Sulphonic Acid*

C-2.3.4 *Aniline-4-Sulphonic Acid*

C-2.3.5 *Sodium Nitrite* — crystals

C-2.3.6 *Hydrochloric Acid* — 1 N

C-2.3.7 *Chromotropic Acid Solution* — 0.05 percent

C-2.3.8 *Sodium Acetate Solution* — 40 percent

C-2.4 Procedure

C-2.4.1 *Preparation of Solutions*

C-2.4.1.1 Prepare 2 percent *m/v* solution of the dye in a mixture of nine parts of water and one part of the ammonium hydroxide.

C-2.4.1.2 *Reference substances*

a) Prepare 0.01 percent on 100 percent basis, (*m*/*v*) solution of 2-naphthol-6-sulphonic acid in nine parts of water and one part of ammonium hydroxide; and

b) Prepare 0.01 percent, on 100 percent basis, (*m*/*v*) solution of aniline-4-sulphonic acid in a mixture of nine parts of water and one part of ammonium hydroxide.

C-2.4.2 *Test Substances*

C-2.4.2.1 *Dye solution*

Ten microlitres of the solution (C-2.4.1.1) shall be equivalent to 200 µg of the sample.

C-2.4.2.2 *Reference substances*

a) *2-naphthol-6-sulphonic acid* [C-2.4.1.2 (a)]

   5 µl shall be equivalent to 0.5 µg corresponding to 0.25 percent in the dye sample. 10 µg shall be equivalent to one µg corresponding to 0.5 percent in the dye sample; and

b) *Aniline-4-Sulphonic acid* [C-2.4.1.2 (b)]

   5 µl shall be equivalent to 0.5 µg corresponding to 0.25 percent in the dye sample. 10 µl shall be equivalent to one µg corresponding to 0.5 percent in the dye sample.

C-2.4.3 Mark out a sheet of chromatographic paper as shown in Fig. 3 of IS 1699 and apply 10 microlitres of the dye solution as uniformly as possible with the help of microsyringe. Also apply reference substances (C-2.4.1.2). Mount the sheet together with plane sheet to act a blank in the frame (C). Pour sufficient developing solvent into the tray (D) to bring the surface of the solvent about 1 cm below the base line of the chromatogram sheet. Put the frame (C) in the same position and replace the cover. Take out the filter paper after 30 cm run. Dry in an oven at 70 °C to 75 °C.

C-2.4.4 *Detection and Semi-Quantitative Estimation*

Inspect the chromatogram under the ultraviolet light. Compare visually the intensity of the fluorescence of the sample with the 2-naphthol-6-sulphonic acid and report the value nearest to the intensity of the reference substance.

Diazotize the chromatogram for 10 min under nitrous acid vapours. (Introduce the paper into a rectangular glass jar in which a beaker containing crystals of sodium nitrate has been kept. Pour the hydrochloric acid into the beaker with the help of the pipette through the hole of the cover). Take out the paper and keep in air for 10 min. Spray the chromatogram with the chromotropic acid solution in the sodium acetate solution. Compare the intensity of the fluorescence of the sample with the reference, substance and report the content of aniline-4-sulphonic acid.

C-3 METHOD II

The column chromatographic method given under IS 1699 shall be followed.

ANNEX D

[*Table* 1, *Sl No.* (vii)]

DETERMINATION OF UNSULPHONATED PRIMARY AROMATIC AMINES

D-1 GENERAL

Unsulphonated primary aromatic amines are extracted into toluene from an alkaline solution of the sample, re-extracted into acid, and then determined spectrophotometrically after diazotization and coupling. They are expressed as aniline unless they are known to be some other amine.

NOTE — This method is not sufficiently sensitive for determining aniline at low mg/kg levels or below.

D-2 APPARATUS

D-2.1 Visible Range Spectrophotometer

D-2.2 Spectrophotometer Cells — 40 mm path length.

D-3 REAGENTS

D-3.1 Toluene

D-3.2 Hydrochloric Acid — 1 N

D-3.3 Hydrochloric Acid — 3 N

D-3.4 Potassium Bromide — 50 percent solution

D-3.5 Sodium Carbonate Solution — 2 N

D-3.6 Sodium Hydroxide — 1 N

D-3.7 Sodium Hydroxide — 0.1 N

D-3.8 R Salt (2-Naphthol-3, 6-Disulphonic Acid, Disodium Salt) Solution — 0.05 N

D-3.9 Sodium Nitrite Solution — 0.5 N

D-3.10 Aniline

D-4 PROCEDURE

D-4.1 Preparation of a Standard Aniline Solution

Weigh 0.100 g of re-distilled aniline into a small beaker and transfer to a 100 ml volumetric flask, rinsing the beaker several times with water. Add 30 ml of 3 N hydrochloric acid and dilute to the mark with water at room temperature. Dilute 10.0 ml of this solution to 100 ml with water and mix well; 1 ml of this solution is equivalent to 0.000 1 g of aniline. Prepare the standard aniline solution freshly when required.

D-4.2 Preparation of a Calibration Graph

Measure the following volumes of the standard aniline solution into a series of 100 ml volumetric flasks: 5 ml, 10 ml, 15 ml, 20 ml, and 25 ml. Dilute to 100 ml with 1 N hydrochloric acid and mix well. Pipette 10 ml of each solution into clean, dry test tubes; cool them for 10 min by immersion in a beaker of ice water. To each tube add 1 ml of the potassium bromide solution and 0.05 ml of the sodium nitrite solution. Mix and allow the tubes to stand for 10 min in the ice water bath while the aniline is diazotized. Into each of five 25 ml volumetric flasks, measure 1 ml of the R salt solution and 10 ml of the sodium carbonate solution. Pour each diazotized aniline solution into a separate flask containing R salt solution and sodium carbonate solution; rinse each test tube with a few drops of water. Dilute to the mark with water, stopper the flasks, mix the contents well and allow them to stand for 15 min in the dark. Measure the absorbance of each coupled solution at 510 nm using 40 mm cells. As a reference solution, use a mixture of 10.0 ml of N hydrochloric acid, 10.0 ml of the sodium carbonate solution, and 2.0 ml of the R salt solution, diluted to 25.0 ml with water. Plot a graph relating absorbance to weight of aniline in each 100 ml of aniline solution.

D-4.3 Preparation and Evaluation of a Test Solution

Weigh, to the nearest 0.01 g, about 2.0 g of the colouring matter sample (M) into a separatory funnel containing 100 ml of water, rinse down the sides of the funnel with a further 50 ml of water, swirling to dissolve the sample, and add 5 ml of 1 N sodium hydroxide. Extract with two 50 ml portions of toluene and wash the combined toluene extracts with 10 ml portions of 0.1 N sodium hydroxide to remove traces of colour. Extract the washed toluene with three 10 ml portions of 3 N hydrochloric acid and dilute the combined extract to 100 ml with water. Mix well. Call this solution T. Pipette 10.0 ml of solution T into a clean, dry test tube, cool for 10 min by immersion in a beaker of ice/water, add 1 ml of the potassium bromide solution and proceed as described above for the preparation of the calibration graph, starting with the addition of 0.05 ml of the sodium nitrite solution. Measure the absorbance of the coupled test solution at 510 nm using a 40 mm cell. Use a reference solution prepared from 10.0 ml of solution T, 10 ml of the sodium carbonate solution, and 2.0 ml of the R salt solution diluted to 25.0 ml with water. From the calibration graph, read the weight of aniline (M_A) corresponding to the observed absorbance of the test solution.

D-5 CALCULATION

Percent unsulphonated primary aromatic amine (as aniline) =

$$\frac{100 \times M_A}{M}$$

where

M_A = mass of aniline from calibration graph; and

M = dry mass, in g, of the colouring matter sample.

ANNEX E

[*Table* 1, *Sl No.* (viii)]

SUDAN I-PHENYLAZO-2-NAPHTHALENOL

E-1 PRINCIPLE

The additive is dissolved in water and methanol and filtered solutions are analyzed by reverse phase liquid chromatography, without extraction or concentration.

E-1.1 Mobile Phase

a) *Eluant A* — Ammonium acetate (LC grade), 20 mM aqueous; and

b) *Eluant B* — Methanol (LC grade).

E-2 REAGENTS

E-2.1 Sample Solution

Accurately weigh 200 mg of sunset yellow FCF and transfer it into a 10 ml volumetric flask. Dissolve the sample in 4 ml water via swirling or sonication. Add 5 ml of methanol and swirl. Allow the solution to cool for 5 min and adjust the volume to the mark with water. Filter a part of the solution for analysis through a 13 mm syringe filter with a 0.2 µm pore size poly tetra fluoroethylene (PTFE) membrane by using a 5 ml polypropylene/ polyethylene syringe.

NOTES

1 Do not substitute a polyvinylidene fluoride (PVDF) filter for the poly tetra fluoroethylene (PTFE) filter, as a polyvinylidene fluoride (PVDF) filter adsorbs Sudan I).

2 Standard Sudan I (> 97 percent), recrystallized from absolute ethanol (5g/150 ml).

E-2.2 Standard Stock Solution

Accurately weigh a sufficient quantity of the standard to prepare a solution in methanol of 0.010 0 mg/ml.

E-2.2.1 *Standard Solutions*

Transfer 0 µl, 20 µl, 50 µl, 100 µl, 150 µl, 200 µl and 250 µl aliquots of the standard stock solution to seven 10 ml volumetric flasks. To each flask, add 5 ml of methanol, swirl to mix, and add 4 ml of water. Dilute to volume with water, mix, and filter each solution through a PTFE membrane syringe filter (*see* E-2.1) into LC vials for analysis.

NOTE — These solutions nominally contain 0 µg, 0.02 µg, 0.05 µg, 0.10 µg, 0.15 µg, 0.20 µg and 0.25 µg of Sudan I/ml.

E-3 CHROMATOGRAPHIC SYSTEM

E-3.1 Detector — Photodiode array (485 nm)

E-3.2 Columns

150 mm × 2.1 mm internal diameter (i.d.), packed with 5 µm reversed phase C18, or equivalent, with a guard column (10 mm × 2.1 mm internal diameter (i.d.).

E-3.3 Column Temperature —25 °C

E-3.4 Flow Rate — 0.25 ml/min

E-3.5 Injection Volume — 50 µl

E-3.6 Elution

50 percent Eluant A/50 percent Eluant B for 5 min; 50 percent to 100 percent Eluant B in 10 min; 100 percent Eluant B for 10 min.

NOTE — The column should be re-equilibrated with 50 percent Eluant A/50 percent Eluant B for 10 min.

E-3.7 System Suitability

Inject three replicates of the standard solutions with concentrations of 0.05 µg and 0.25 µg of Sudan I/ml. The responses for each set of three injections show relative standard deviations of not more than 2 percent.

E-4 PROCEDURE

Separately inject the seven standard solutions and the sample solution into the chromatograph and measure the peak areas for Sudan I. From the chromatograms for the standard solutions, prepare a standard curve of the concentration of Sudan I *versus* the peak areas. Determine the concentration of Sudan I in the sample solution and convert it to mg/kg in the sample of sunset yellow FCF.

NOTES

1 The retention time for Sudan I is 19.0 min. Other peaks appearing at earlier retention times in the sample chromatograph are likely attributed to sulphonated subsidiary colours.

2 The limit of determination is 0.4 mg/kg.

ANNEX F

(*Foreword*)

COMMITTEE COMPOSITION

Food Additives Sectional Committee, FAD 08

Organization	*Representative(s)*
CSIR - Indian Institute of Toxicology Research, Lucknow	Dr Yogeshwar Shukla (***Chairperson***)
All India Food Processors Association, New Delhi	Ms Shreya Pandey Shri Krishna Kumar Joshi (*Alternate*)
Association of Food Scientists and Technologists India, Mumbai	Dr Vikas Singh Chauhan Dr Nandini P. Shetty (*Alternate*)
Bose Institute, Kolkata	Prof Gaourishnkar
Confederation of Indian Food Trade and Industry, New Delhi	Dr Jasvir Singh Ms Priyanka Sharma (*Alternate*)
Confederation of Indian Industry, New Delhi	Ms Neha Aggarawal Ms Mamta Arora Budhiraja (*Alternate*)
Consumer Education and Research Centre, Ahmedabad	Ms Anindita Mehta Ms Dolly A. Jani (*Alternate*)
Consumer Guidance Society of India, Mumbai	Dr Sitaram Dixit Dr M. S. Kamath (*Alternate*)
CSIR - Central Food Technological Research Institute, Mysuru	Dr Ngaseppam Iboyiama Shri Aruna Kumar (*Alternate*)
Defence Food Research Laboratory, Mysuru	Dr G. K. Sharma Dr D. D. Wadikar (*Alternate*)
Department of Chemical Technology, University of Calcutta, Kolkata	Prof Arup Mukherjeee Dr Farooque Abdullah (*Alternate*)
Envirocare Labs Private Limited, Thane	Dr Priti Amritkar Dr Nilesh Amritkar (*Alternate*)
Food Ingredients Manufacturers & Suppliers of India Association, Mumbai	Shri Firoz H. Naqvi
Grasim Industry, Mumbai	Shri Pankaj Kumar Gupta
ICMR - National Institute of Nutrition, Hyderabad	Dr J. Padmaja
Indian Institute of Chemical Technology, Hyderabad	Dr Ashok Kumar Tiwari Dr T. Kumaraguru (*Alternate*)
Indian Pharmacopoeia Commission, Ghaziabad	Ms Shruti Rastogi Shri Jai Shiv Chauhan (*Alternate*)
Indian Salt Manufacturers Association, Ahmedabad	Shri B. C. Rawal Shri P. R. Dhruve (*Alternate*)

Organization	*Representative(s)*
Office of the Salt Commissioner, Jaipur	SHRI M. A. ANSARI SHRI B. S. NAGAR (*Alternate*)
Protein Foods and Nutrition Development Association of India, Mumbai	SHRI BHUPINDER SINGH DR JAGADISH PAI (*Alternate*)
Roha Dyechem, Mumbai	SHRI ZAINULABIDIN DHANSE
VR Food Tech Pvt Ltd, Mumbai	DR ASHLESH PARCHURE DR N. RAM (*Alternate*)
BIS Directorate General	SHRIMATI SUNEETI TOTEJA, SCIENTIST ‘E’/DIRECTOR AND HEAD (FOOD AND AGRICULTURE) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
SHRI KULDEEP MITTAL
SCIENTIST ‘B’/ASSISTANT DIRECTOR
(FOOD AND AGRICULTURE), BIS

(*Continue from second cover*)

Solubility — Soluble in water (sparingly soluble in ethanol).

Molecular Weight — 452.38 g/mol.

In the formulation of this standard, due consideration has been given to the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011 and *Food Safety and Standards Act*, 2006 and rules framed thereunder. This standard is however subject to restrictions imposed under these rules, wherever applicable.

The composition of the Committee responsible for the formulation of this standard is given in Annex F.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022. ‘Rules for rounding off numerical values (*second revision*)’ This number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

This Indian Standard has been developed from Doc No.: FAD 08 (22584).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices: *Telephones*

Central : 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002 — 2323 7617

Eastern : 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091 — 2367 0012, 2320 9474

Northern : Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019 — 265 9930

Southern : C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113 — 2254 1442, 2254 1216

Western : Manakalya, 4th Floor, NTH Complex (W Sector), F-10, MIDC, Andheri (East), Mumbai 400093 — 283 25838

Branches : AHMEDABAD, BENGALURU, BHOPAL, BHUBANESHWAR, CHANDIGARH, CHENNAI, COIMBATORE, DEHRADUN, DELHI, FARIDABAD, GHAZIABAD, GUWAHATI, HARYNA, HUBLI, HYDERABAD, JAIPUR, JAMMU & KASHMIR, JAMSHEDPUR, KOCHI, KOLKATA, LUCKNOW, MADURAI, MUMBAI, NAGPUR, NOIDA, PARWANOO, PATNA, PUNE, RAIPUR, RAJKOT, SURAT, VIJAYAWADA.

Published by BIS, New Delhi