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*भारतीय मानक मसौदा*

**सोडियम मेटाबिसल्फाइट, खाद्य ग्रेड — विशिष्टि**  
*(आई एस 4752 का दूसरा पुनरीक्षण)*

*Draft Indian Standard*

**SODIUM METABISULPHITE, FOOD GRADE — SPECIFICATION**

*(second revision of IS 4752)*

**ICS 67.220.20**

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Food Additives Sectional Committee, FAD 08

**Last date of comments:** 23 February 2025

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**FOREWORD**

*(Formal clauses would be added later)*

Food additives are added to improve the appearance, flavour, texture or storage properties, etc of the processed foods. As certain impurities in these substances have been found to be harmful, it is necessary to have a strict quality control of these food additives. A series of standards have, therefore, been prepared to cover purity and identification of these substances. These standards would help in checking purity, which is required to be checked at the stage of manufacture, for it is extremely difficult to detect the impurity once these substances have been added to the processed foods. Besides, these standards are intended to guide the indigenous manufacturers in making their product conform to specifications that are accepted by scientists, health authorities and national/international bodies.

Sodium metabisulphite widely used as food preservative, is permitted under the *Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011*.

**Chemical Names and Formula** — The recognized chemical names are sodium metabisulphite and sodium pyrosulphite. Chemical formula is  $\text{Na}_2\text{S}_2\text{O}_5$ . Its molecular weight is 190.11.

This standard was first published in 1968. In the first revision in 1994, considerable assistance has been derived from FAO Food and Nutrition Paper No. 4 Specification for identity and purity of thickening agents, anticaking agents, antimicrobials, antioxidants and emulsifiers; published by the Joint FAO/WHO Expert Committee on Food Additives, Rome 1978; Food Chemical Codex, 1981 Pub. National Academy of Sciences, and National Research Council, Washington DC, USA; and Council Directive 65/66/EEC of 26 January 1965 laying down specific criteria of purity for preservatives authorized for use in foodstuffs intended for human consumption.

In the first revision, solubility was brought under description as a Note informing the user that it is intended only as information regarding approximate solubility and is not to be considered as a quality requirement. Also, the limit of thiosulphate was made more stringent and the requirement for lead was substituted by heavy metals.

In this revision, two amendments issued to the previous version of the standard have been incorporated and the following major changes have been made:

- a) The requirement of purity of sodium metabisulphite in terms of SO<sub>2</sub> has been removed in line with JECFA Monograph;
- b) The limit of Selenium (as Se) has been made more stringent in line with JECFA Monograph.
- c) The limit of lead has been incorporated in line with JECFA Monograph.
- d) The requirement for heavy metals has been removed as the limit of lead (contaminant in food colours) is being covered through the standard; and
- e) The marking requirements have been updated.

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*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## 1 SCOPE

This standard prescribes the requirements and the method of sampling and test for sodium metabisulphite for use as a food preservative.

## 2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions 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 editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
IS 1070 : 2023	Reagent grade water — Specification ( <i>fourth revision</i> )
IS 1699 : 2024	Food colours — Methods of sampling and test ( <i>third revision</i> )
IS 2711 : 1979	Specification for direct reading pH meters ( <i>second revision</i> )
IS 4751 : 2023	Potassium metabisulphite food grade — Specification ( <i>second revision</i> )

## 3 REQUIREMENTS

### 3.1 Description

The material shall be colourless crystals or white to yellowish crystalline powder having an odour of sulphur dioxide. The material is soluble in water but insoluble in ethanol.

NOTE — The solubility is intended only as information regarding approximate solubility and is not to be considered as a quality requirement and is of minor significance as a means of identification or determination of purity.

### 3.2 Identification Test

**3.2.1** Aqueous solution of the material shall be acidic to a solution of phenol red.

**3.2.2** Aqueous solution of the material shall decolourize a solution of iodine.

**3.2.3** Ten percent solution of the material shall give positive test for sodium given in **3.2.3.1** and positive test for sulphite given in **3.2.3.2**.

#### **3.2.3.1** *Test for sodium*

When uranyl zinc acetate is added to the solution, yellow crystalline precipitate shall be formed with several minutes agitation.

#### **3.2.3.2** *Test for sulphite*

When dilute sulphuric acid is added to the solution, sulphur dioxide shall be produced which may be recognized by its characteristic odour, or by blackening of filter paper moistened with mercurous nitrate or by the development of a blue colour on filter paper treated with potassium iodate and starch.

### 3.3 Water Insolubles

Twenty grams of the material when dissolved in 200 ml of water shall give a clear solution with only a trace of suspended matter.

**3.4** The material shall also conform to the requirements given in Table 1.

#### **4 PACKING**

The material shall be securely packed in well-filled containers with a minimum access to air and light. The containers shall be such as to preclude contamination of the contents with metals or other impurities.

#### **5 STORAGE**

The material shall be stored in a cool and dry place so as to avoid excessive exposure to heat.

#### **6 MARKING**

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

- a) Name of the material including the words 'Food Grade';
- b) Source of manufacture;
- c) Net content when packed;
- d) Batch or code number;
- e) Date of manufacture; and
- f) Expiry/ Best before date;
- g) Any other requirements as specified under the *Legal Metrology (Packaged Commodities) Rules, 2011* and *Food Safety and Standards (Labelling and Display) Regulations, 2020*.

**Table 1 Requirements for Sodium Metabisulphite, Food Grade**  
(Clause 3.4)

<b>SI. No.</b>	<b>Characteristic</b>	<b>Requirement</b>	<b>Method of test, Ref to</b>
<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
i)	Purity as Na <sub>2</sub> S <sub>2</sub> O <sub>5</sub> , percent by mass, <i>Min</i>	95	Annex A
ii)	Water insoluble matter, percent by mass, <i>Max</i>	0.05	Annex B
iii)	Thiosulphate, percent by mass, <i>Max</i>	0.1	IS 4751
iv)	Arsenic (as As), mg/kg, <i>Max</i>	3	IS 1699
v)	Iron (as Fe), mg/kg, <i>Max</i>	5	Annex C
vi)	Selenium (as Se), mg/kg, <i>Max</i>	5	IS 4751
vii)	Lead (as Pb), mg/kg, <i>Max</i>	2	IS 1699
viii)	pH	4.0 to 4.5	Annex D

#### **6.2 BIS Certification Marking**

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

## **7 SAMPLING**

Representative samples of the material shall be drawn according to the methods prescribed in 4 of IS 1699.

## **8 TESTS**

**8.1** Tests shall be carried out by the methods as specified in col 4 of Table 1.

### **8.2 Quality of Reagents**

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

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

**ANNEX A**  
[Table 1, SI No. (i)]  
**DETERMINATION OF PURITY**

**A-1 REAGENTS**

**A-1.1 Standard Iodine Solution** — 0.1 N.

**A-1.2 Concentrated Hydrochloric Acid**

**A-1.3 Standard Sodium Thiosulphate Solution** — 0.1 N.

**A-1.4 Starch Solution**

Mix 1 g of starch and 10 mg of red mercuric iodide and sufficient cold water to make a thin paste. Add 200 ml of boiling water, boil for 1 min with continuous stirring and cool. Use only the clear solution.

**A-2 PROCEDURE**

**A-2.1** Weigh accurately about 0.200 g of the material and add it to 50 ml of standard iodine solution, contained in a glass stoppered flask, and stopper the flask. Allow it to stand for 5 min, add 1 ml of concentrated hydrochloric acid and titrate the excess iodine with standard sodium thiosulphate solution, adding starch solution as the end point is reached. Each ml of 0.1 N iodine is equivalent to 0.004752 g of Na<sub>2</sub>S<sub>2</sub>O<sub>5</sub>.

**ANNEX B**  
[Table 1, SI No. (ii)]  
**DETERMINATION OF WATER INSOLUBLE MATTER**

**B-1 PROCEDURE**

**B-1.1** Dissolve about 10 g of the material, accurately weighed, in 50 ml of water. Filter through a weighed Gooch crucible fitted with an asbestos pad or through a weighed sintered glass crucible (G No. 4), previously washed and dried at 105 °C to 110 °C and wash well with water. Dry the residue to constant mass at 105 °C to 110 °C.

**B-1.2** Matter insoluble in water, percent by mass =  $\frac{100 M_1}{M_2}$

Where

$M_1$  = mass, in g, of the residue; and

$M_2$  = mass, in g, of the material taken for the test

**ANNEX C**  
[Table 1, Sl No. (v)]  
**DETERMINATION OF IRON**

**C-1 REAGENTS**

**C-1.1 Bromine Solution**

Prepare saturated solution of bromine by agitating 2 to 3 ml of bromine with 100 ml of cold water in a glass stoppered bottle, the stopper of which should be lubricated with petroleum. Store in a cool place and protect from light.

**C-1.2 Hydrochloric Acid**

**C-1.3 Ammonium Persulphate**

**C-1.4 Ammonium Thiocyanate Solution** — Dissolve 8 g of ammonium thiocyanate ( $\text{NH}_4\text{CNS}$ ), in sufficient water to make 100 ml.

**C-1.5 Standard Iron Solution** — 10 mcg Fe.

**C-2 PROCEDURE**

**C-2.1** To 500 mg of the sample, add 2 ml of hydrochloric acid and evaporate to dryness on a steam-bath. Dissolve the residue in 2 ml of hydrochloric acid and 20 ml of water, add a few drops of bromine solution, and boil the solution to remove the bromine. Cool, dilute with water to 25 ml, then add 50 mg of ammonium persulphate and 5 ml of ammonium thiocyanate solution. Any red or pink colour does not exceed that produced in a control containing 1.0 ml of standard iron solution (10 mcg Fe).

**ANNEX D**  
[Table 1, Sl No. (viii)]  
**DETERMINATION OF pH**

**D-1 APPARATUS**

**D-1.1 pH Meter** — use a standard laboratory pH meter (*see* IS 2711)

**D-2 PROCEDURE**

Dissolve 10 g of the sample in 100 ml water. Measure the pH of the solution using a standard pH meter. Repeat the test and record the mean pH value.