

**BUREAU OF INDIAN STANDARDS**

**DRAFT FOR COMMENTS ONLY**

*(Not to be reproduced without the permission of BIS or used as an Indian Standard)*

भारतीय मानक मसौदा

**सोडियम प्रोपियोनेट, खाद्य ग्रेड – विशिष्टि**

*(आइ एस 6030 का दूसरा पुनरीक्षण)*

*Draft Indian Standard*

**SODIUM PROPIONATE, FOOD GRADE - SPECIFICATION**

*(Second Revision of IS 6030)*

**ICS No. 67.220.20**

Food Additives Committee, FAD 08

Last Date of Comments: **10 May 2024**

**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 requires 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 propionate is an anti-roping agent and a mould inhibitor. It is permitted for bread under the *Food Safety and Standards (Food Products Standards and Food Additives) Regulation, 2011*.

The empirical formula, structural formula and molecular weight of Sodium Propionate are as follows: -

<i>Empirical Formula</i>	<i>Structural Formula</i>	<i>Molecular Weight</i>
C <sub>3</sub> H <sub>5</sub> O <sub>2</sub> Na	CH <sub>3</sub> -CH <sub>2</sub> -COONa	96.06

Considerable assistance were derived from the following publications in preparing this standard:

a) Specification for Identity and Purity of Food Additives, Volume I: Antimicrobial Preservatives and Antioxidants, 1962.

b) Food Chemical Codex, Third Edition. Pub. National Academy of Science, National Research Council, Washington, DC.

This standard was first published in 1971. It was revised to provide description clause, including solubility, separately from requirements to keep it in line with Food Chemical Codex, NRC; to upgrade the standard by bringing down the limit for moisture and iron; to substitute the requirement of lead by heavy metals and corresponding change in test method, and to provide for 'directions for storage' and 'Best before date'.

In this revision, the following major 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.
- b) The requirement of copper, cadmium and mercury have been incorporated in line with *Food Safety and Standards (Contaminations, Toxins and Residues) Regulations, 2011*.
- c) The marking requirements have been updated.
- d) One amendment issued to the previous version of the standard has been incorporated.

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 : 2002 'Rules for rounding off numerical values (revised)'. 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 methods of tests for sodium propionate, food grade.

## 2 REFERENCES

The following Indian Standards 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 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 : 1995	Methods of sampling and test for food colours ( <i>second revision</i> )
IS 2362 : 1993	Method for determination of water by the Karl Fischer Method ( <i>second revision</i> )
IS 6031 : 2023	Calcium propionate, food grade – Specification ( <i>second revision</i> )

## 3 DESCRIPTION

Sodium propionate shall be colourless and in the form of transparent crystals or a granular crystalline powder. It shall be odourless or has a faint acetic butyric odour. It shall be deliquescent in moist air and freely soluble in water and soluble 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, and dependence must be placed on other specifications.

## 4 REQUIREMENTS

### 4.1 Identification Tests

**4.1.1** Five percent solution of material gives positive test for sodium. A solution of sodium propionate acidified with dilute acetic acid, filtered, if necessary, and treated with uranyl zinc acetate, shall yield a yellow crystalline precipitate, indicating the presence of sodium.

**4.1.2** Upon ignition, the material shall yield an alkaline residue which effervesces with acids.

**4.1.3** Warm a small sample with sulphuric acid. Propionic acid evolved shall be recognized by its odour.

**4.2** The pH of the 10 percent (*m/v*) solution of the material at  $25 \pm 2^\circ\text{C}$ , shall be between 7.5 and 10.

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

## 5 PACKING AND STORAGE

### 5.1 Packing

The material shall be securely packed in well-filled containers so as to preclude contamination of the contents.

## 5.2 Storage

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

**Table 1 Requirements for Sodium Propionate, Food Grade**  
(Clause 4.3)

Sl. No.	Characteristic	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Purity as $C_3H_5NaO_2$ , percent by mass, on dry basis, <i>Min</i>	99.0	Annex A
ii)	Moisture, percent by mass, <i>Max</i>	4.0	IS 6031
iii)	Water insoluble matter, percent by mass, <i>Max</i>	0.1	IS 6031
iv)	Arsenic (as As), mg/kg, <i>Max</i>	3.0	IS 1699
vi)	Iron (as Fe), mg/kg, <i>Max</i>	30.0	Annex B
vii)	Lead (as Pb), mg/kg, <i>Max</i>	5.0	IS 1699
viii)	Fluoride (as F), mg/kg, <i>Max</i>	10.0	IS 6031
ix)	Copper (as Cu), mg/kg, <i>Max</i>	30.0	IS 1699
x)	Cadmium (as Cd), mg/kg, <i>Max</i>	1.5	IS 1699
xi)	Mercury (as Hg), mg/kg, <i>Max</i>	1.0	IS 1699

## 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) Name of the manufacturer or his registered trade-mark, if any;
- c) Net quantity when packed;
- d) Lot/batch No.;
- e) Month and year of manufacture;
- f) Best before .....months from manufacture; and
- g) Any other requirements as specified under the *Legal Metrology (Packaged Commodities) Rules, 2011* and *Food Safety and Food Safety and Standards (Packaging) Regulations, 2018* and *Food Safety and Standards (Labelling and Display) Regulations, 2020*.

### 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

The representative samples of the material shall be drawn according to the method prescribed in IS 1699.

## 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.

**ANNEX A**  
[Table 1, Sl No. (i)]  
**DETERMINATION OF SODIUM PROPIONATE CONTENT**

**A-1 METHODS**

**A-1.1** Two methods have been specified. Either could be used depending upon the facilities available.

**A-2 METHOD I**

Proceed as per Method I of Annex A of IS 6031 except for the fact that each millilitre of 1 N sodium hydroxide corresponds to 0.096 07 g of sodium propionate.

**A-3 METHOD II**

**A-3.1 Reagents**

**A-3.1.1** *Glacial Acetic Acid*

**A-3.1.2** *Methyl rosaniline Chloride* - Dissolve 100 mg of methyl rosaniline chloride in 10 ml of glacial acetic acid.

**A-3.1.3** *Perchloric Acid* - 0.1 N.

**A-4 PROCEDURE**

**A-4.1** Weigh accurately about 250 mg of the sample and dissolve it in 40 ml of glacial acetic acid, warming if necessary to effect solution. Cool to room temperature, add 2 drops of methyl rosaniline chloride. Titrate with perchloric acid. Perform blank and make necessary correction. Each millilitre of 0.1 N perchloric acid is equivalent to 9.606 mg of  $C_3H_5NaO_2$ .

**ANNEX B**  
[Table 1, Sl No. (vi)]  
**DETERMINATION OF IRON**

Proceed as per Annex D of IS 6031 except that (equivalent to 60  $\mu$ g of iron ion) in the comparison at **D-3.1.2** use 6 ml of the standard iron solution test.