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भारतीय मानक मसौदा

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(आइ एस 5709 का तीसरा पुनरीक्षण)

Draft Indian Standard

CALCIUM SACCHARIN, FOOD GRADE - SPECIFICATION

(Third Revision of IS 5709)

ICS No. 67.220.20

Food Additives Committee, FAD 08

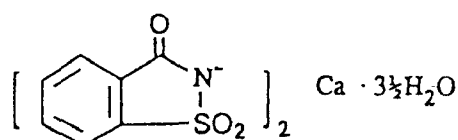
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FOREWORD

(Formal clauses would be added later)

Calcium saccharin is a non-nutritive sweetener. It is taken by diabetics and those who need low calorie diet as a substitute for cane sugar. It is about 500 times sweeter than sugar. Use of calcium saccharin, food grade as artificial sweetener has been permitted in selected food items under the *Food Safety and Standards (Food Products Standards and Food Additives) Regulation, 2011*.

Chemical Names and Formula – The recognized chemical names are calcium-o-benzosulfimide; calcium salt of 2,3 dihydro-3-oxobenzisulfonazole; and 1,2-benzisothiazole-3-one-1, 1-dioxide. Its empirical formula is $C_{14}H_8CaN_2O_6S_2 \cdot 3\frac{1}{2}H_2O$. Its molecular weight is 467.48 and structural formula is as under:



This standard was first issued in 1969 and subsequently revised in 1978 and 1997. In the second revision, the limits for toluene sulphonamide was reduced; and directions for storage and expiry date were incorporated.

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 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 : 2002 '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 methods of sampling and test for calcium saccharin, 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>)
Doc: FAD 08 (23204)WC	Methods of sampling and test for food colours (<i>third revision of IS 1699</i>)
Doc: FAD 08 (25085)WC	Sodium saccharin, food grade - Specification (<i>third revision of IS 5345</i>)

3 DESCRIPTION

It shall be in the form of white crystals or white crystalline powder. It shall be odourless or having a faint odour and an intensely sweet taste even in dilute solutions. One gram of calcium saccharin is soluble in 1.5 ml of water.

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.

4 REQUIREMENTS

4.1 Identification

4.1.1 Dissolve about 100 mg of the material in 5 ml of 5 percent sodium hydroxide solution. Evaporate to dryness and gently fuse the residue over a small flame until it no longer evolves ammonia. After the residue has cooled, dissolve it in 20 ml of water, neutralize the solution with dilute hydrochloric acid and filter. The addition of a drop of 9 percent ferric chloride solution to the filtrate shall produce a violet colour.

4.1.2 Mix 20 mg of the material with 40 mg of the resorcinol, add 10 drops of sulphuric acid and heat the mixture in a liquid bath at 200°C for 3 minutes. After cooling add 10 ml of water and an excess of sodium hydroxide solution (dissolve 4.3 g of sodium hydroxide in water and make 100 ml). A fluorescent green liquid shall result.

4.1.3 To 10 ml of 10 percent solution of the material, add 1 ml of hydrochloric acid. A crystalline precipitate of saccharin shall be formed. Wash the precipitate well with cold water and dry at 105°C for 2 hours. It shall melt between 226°C and 230°C.

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

Table 1 Requirements for Calcium Saccharin, Food Grade

(Clause 4.3)

Sl No.	Characteristic	Requirements	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Purity as C ₁₄ H ₈ CaN ₂ O ₆ S ₂ , on dry basis, percent by mass, <i>Min</i>	99	Annex A
ii)	Moisture, percent by mass, <i>Max</i>	15	Doc: FAD 08 (25085)WC
iii)	Benzoic and salicylic acid	Pass the test	Doc: FAD 08 (25085)WC
iv)	Readily Carbonizable Substances	Pass the test	Doc: FAD 08 (25085)WC
v)	Toluenesulfonamides, mg/kg, <i>Max</i>	25	Doc: FAD 08 (25085)WC
vii)	Arsenic (as As), mg/kg, <i>Max</i>	3	Doc: FAD 08 (25085)WC
viii)	Selenium,(as Se), mg/kg, <i>Max</i>	30	Doc: FAD 08 (25085)WC
ix)	Lead (as Pb), mg/kg, <i>Max</i>	2	Doc: FAD 08 (23204)WC

5 PACKING AND STORAGE

5.1 Packing

The material shall be filled in amber coloured glass containers and/or other containers with as little air space as possible. The container shall be such as to preclude contamination of the contents with metals or other impurities.

5.2 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) 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) Expiry date; 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 Doc: FAD 08 (23204)WC.

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)]
METHOD OF TEST FOR PURITY

A-1 REAGENTS

A-1.1 Dilute Hydrochloric Acid

A-1.2 Chloroform

A-1.3 Alcohol

A-1.4 Phenolphthalein Indicator

A-1.5 Standard Sodium Hydroxide Solution - 0.1 N.

A-2 PROCEDURE

Dry the material at 105°C and weigh accurately about 500 mg and transfer it quantitatively to a separator with the aid of 10 ml of water. Add 2 ml precipitated saccharin first with 30 ml, then with five 20 ml portions, of a solvent composed of 9 volumes of chloroform and 1 volume of alcohol. Filter each extract through a small filter paper moistened with the solvent mixture, and evaporate the combined filtrates on a steam bath to dryness with the aid of a current of air. Dissolve the residue in 75 ml of hot water, cool, add phenolphthalein indicator, and titrate with standard sodium hydroxide solution. Perform a blank determination and make necessary corrections. Each ml of 0.1 N sodium hydroxide solution is equivalent to 20.22 mg of calcium saccharin (C₁₄H₈CaN₂O₆S₂).