

Twelve Chemicals have been identified for examination for making BIS standards mandatory

(I) Citric Acid (Food Grade) IS 13186: 1991, Reaffirmed in 2014 (HS Code 29181400)

Citric Acid is used as natural preservative in food & soft drinks, as flavouring agent in beverages like food juices, pickles etc. Its use has been permitted in the Prevention of Food Adulteration Rules.

Citric acid also known as 2-hydroxpropane-1,2,3-tricarboxylic acid (C₆H₈O₇) occurs in many fruits, especially unripe fruits of the citrus family such as lemons and organs. It is extensively used in soft drinks and other food industries. It is also put to pharmaceutical uses. Any undesirable impurity in Citric Acid Food Grade will lead to contamination of food products, in which it is used as a food additive, thus have direct impact on the human health. So to protect human health, it is imperative to make the standard mandatory.

With the increased production of processed foods, manufacturers have started adding a large number of substances, generally in small quantities, to improve the appearance, flavour, texture or storage properties and in some cases to enhance the nutritive value 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.

The requirements of Citric Acid, Food Grade are described as under:

SI No.	Characteristic	Requirement
1	Purity as C ₆ H ₈ O ₇ percent by mass, (calculated on the anhydrous basis), Min	99.5
2	Moisture, percent by mass, Max a) anhydrous b) monohydrate	0.5 8.8
3	Sulphated ash, percent by mass, Max	0.05
4	Heavy metals (as Pb), mg/kg, Max	10
5	Aresnic, mg,kg, Max	3
6	Oxalates (as C ₃ H ₃ O ₄)	To pass test
7	Readily carbonizable substances	To pass test
8	Water insoluble matter, ppm, Max	30
9	Chloride (as Cl), ppm, Max	5

10	Phosphate (as P ₂ O ₅), ppm, Max	5
11	Calcium, ppm, Max	25
12	Tridodecylamine, ppm, Max	0.1
13	Lead (as Pb), mg/kg, Max	0.5

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
395	454	12	19

(II) Acetic Acid IS 695: 1986, Reaffirmed 2013 (HS Code 29152100)

Acetic acid is used in the manufacture of cellulose acetate, vinyl acetate, Acetic Anhydride, Ester production and in textile industry for dyeing purposes and as a chemical reagent. It is also used in pharmacy and sanitary goods and surgical gloves. Some of the popular thinners, such as butyl and ethyl acetates, used in the paint industry, are also prepared from acetic acid. In a dilute form, popularly known as white-wine vinegar it is used in pickles. So to protect human health, it is imperative to make the standard mandatory.

The material, when required for pharmaceutical purposes, shall contain not more than two parts per million of Arsenic.

The requirements of Acetic Acid are described as under:

SI No.	Characteristic	Requirement		
		Technical	Pure	Analytical Reagent
1	Solubility in water	-	Shall be completely miscible	No turbidity within one hour
2	Relative density at 27/27 ⁰ C, Max	1.0528	1.0496	1.0483
3	Acetic acid content (CH ₃ COOH), percent by mass, Min	98.0	99.5	99.7
4	Crystallizing point, °C, Min	-	15.6	16.0
5	Residue on evaporation, percent by mass, Max	0.02	0.01	0.001
6	Chlorides (as Cl), ppm, Max	35	15	1
7	Iron (as Fe), ppm, Max	-	2	1
8	Sulphates (as SO ₄), ppm, Max	35	2	1

9	Heavy metals (including iron) calculated as Pb, ppm, Max	20	5	1
10	Formic acid (HCOOH), percent by mass, Max	0.35	0.15	0.025
11	Acetaldehyde (CH ₃ CHO)	0.15	0.05	0.003
12	Oxidizable impurities	-	To pass the test	To pass the test
13	Water content, percent by mass, Max	-	-	0.2

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
1,939	2,906	62	54

(III) Synthetic Food Colours IS 5346: 1994, Second Reprint January 2006 (including Amendment No 1)(HS CODE 32030020)

Synthetic Food Colours are used as dyes in the food, pharmaceuticals, cosmetic & various other industries. Any undesirable impurity in Synthetic Food Colours will lead to contamination of end products, in which it is used as a coloring agent, thus have direct impact on the human health. This standard is aligned with specification for basic synthetic food colour issued by the FAO/WHO. The resultant product need to be free from mercury, copper and chromium in any form, aromatic amines, aromatic nitro compounds, aromatic hydrocarbons, amino benzidines & cyanides. So it is imperative to make the standard mandatory to protect the human health.

The requirements of synthetic food colours are as under:

SI No.	Characteristic	Requirement
1	Water insoluble matter, percent by mass (on dry basis), Max	1.0
2	Lead (as Pb), mg/kg Max	10
3	Arsenic (as As), mg/kg, Max	3.0
4	Heavy metals, mg/kg, Max	40

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
4	5	15	26

(IV) Potassium Metabisulphite, Food Grade IS 4751: 1994, Reaffirmed 2014 (HS Code 28322010)

Used as bleaching agent in production of coconut cream, preservative in pickles, disinfectant, anti oxidants.

With the increased production of processed foods, manufacturers have started adding a large number of substances, generally in small quantities, to improve the appearance, flavour, texture or storage properties 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 was, therefore, prepared to cover purity and identification of these substances. Any undesirable impurity in Potassium Metabisulphite Food Grade will lead to contamination of food products, in which it is used as a food additive, thus have direct impact on the human health. So it is imperative to make the standard mandatory to protect the human health.

Potassium metabisulphite widely used as food preservative, is permitted under the Prevention of Food Adulteration Rules, 1955, as well as Fruit Products Order, 1955.

The requirements of Potassium Metabisulphite are described as under:

SI No.	Characteristic	Requirement
1	Purity, as $K_2S_2O_5$, percent by mass, Min	90
2	Water insoluble matter, percent by mass, Max	0.05
3	Thiosulphate, percent by mass, Max	0.1
4	Arsenic (as As), mg/kg, Max	3.0
5	Iron (as Fe), mg/kg, Max	5
6	Selenium (as Se), mg/kg, Max	30
7	Heavy metals, mg/kg, Max	10
8	pH	Acidic to litmus

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
0.0045	0.0144	0.13	0.16

(V) Calcium Propionate, Food Grade (IS 6031: 1997), Reaffirmed 2014 (HS Code 29155000)

Calcium propionate is an anti-roping agent and a mould inhibitor. It is also permitted for use as preservative Bread and Bakery under the Prevention of Food Adulteration Rules, 1955. It is also used as food additive.

With the increased production of processed foods, manufacturers have started adding a large number of substances, generally in small quantities, 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 was, therefore, prepared to cover purity and identification at the stage of manufacturer. Any undesirable impurity in Calcium Propionate Food Grade will lead to contamination of food products, in which it is used as a food additive, thus have direct impact on the human health. So it is imperative to make the standard mandatory to protect the human health.

The requirements of Calcium Propionate, food grade are described as under:

Sl No.	Characteristic	Requirement
1	Purity as $C_6H_{10}O_4Ca$, percent by mass, on dry basis, Min	98
2	Moisture, percent by mass, Max	5.0
3	Matter insoluble in water, percent by mass, Max	0.3
4	Arsenic (as As), mg/kg, Max	3
5	Heavy metals (as Pb), mg/kg, Max	4.0
6	Iron (as Fe), mg/kg, Max	50
7	Fluoride, mg/kg, Max	10
8	Magnesium (as Mg O) to pass the test	0.4%

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
139	186	154	169

(VI) Benzoic Acid, Food Grade (IS 4448: 1994), Reaffirmed 2014, (HS Code 29163110)

Used as food preservative, as an antifungal agent in ointments, pharma products, food and beverage like fruit juice (citric acid), sparkling drinks (carbon dioxide), soft drinks (phosphoric acid), pickles (vinegar) or other acidified food are preserved with benzoic acid and benzoates. It is widely used as food preservative. It is permitted under the Prevention of Food Adulteration Rule, 1955, as well as Fruit Products Order, 1955. It is also included in food chemical codex and also falls under IP and BP and USP. Any undesirable impurity in Benzoic Acid Food Grade will lead to contamination of food products, in which it is used as a food additive, thus have direct impact on the human health. So to protect human health, it is imperative to make the standard mandatory. The random test sampling by BIS will facilitate to maintain the quality of the product as per the standard.

Benzoic acid is used as preservative for food, fats and in the manufacture of benzoates and benzoyl compounds, dyes as a mordant in calico printing, for curing tobacco. It is also used as an anti-fungal agent in medicine, flavours, perfumes, dentrifices, plasticizers and alkyd resins.

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
107	116	6	5

(VII) Methanol (Methyl Alcohol) IS 517: 1986, Reaffirmed 2013 (HS Code 29051100)

As solvent in organic relation, as fuel, Denaturant, Bio diesel via transesterification. High purity methanol is required for the manufacturer of antibiotics. Any impurity of Methanol may migrate to antibiotics, which is harmful to be human being. So to protect human health, it is imperative to make the standard mandatory.

There shall be two grades of the material, namely:

- a) Methanol, pure
- b) Methanol, technical

The requirements of Methanol (Methyl Alcohol) are described as under:

SI No.	Characteristic	Requirement	
		Methanol Pure	Methanol Technical
1	Relative density at 27°/27° C, Max	0.789	0.798
2	Distillation range at 760 mm pressure	The difference between initial boiling point (IBP) and dry point (DP) shall not exceed 1°C including 64.5°C	Not less than 95 percent shall distil between 65.5°C and 66.5°C (temperature being corrected for a pressure of 760mm of Hg)
3	Residue on evaporation, percent by mass, Max	0.01	0.015
4	Alkalinity (as NH ₃), percent by mass, Max	0.0003	0.0003
5	Acidity, as acetic acid (CH ₃ CO-OH) percent by mass, Max	0.004	0.006
6	Aldehydes and ketones, as acetone (CH ₃ COCH ₃) percent by mass, Max	0.03	0.100
7	Sulphur and compounds of sulphur (as S), percent by mass, Max	0.001	-
8	Chlorine and chlorine compounds	To pass test	-
9	Water content, percent by mass, Max	0.1	0.5
10	Acidity as acetic acid percent by mass	0.002	-
11	Aldehydes & Ketones	0.001	-
12	Residue on evaporation	0.001	-

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
6048	5846	456	904

(VIII) Ethylene Glycol IS 5295: 1985, Reaffirmed in 2013 (HS Code 29053100)

Used in Polyester resins, fibre, filament industry, films and as coolant etc. Since this product is predominantly consumed in the manufacture of polyester fibre/garments, so to protect human skin, it is imperative to make the standard mandatory.

Ethylene Glycol has available in two grades of the material:

- a) General grade
- b) Fibre grade

The requirements of Ethylene Glycol are described as under:

Sl No.	Characteristic	Requirement	
		General Grade	Fibre Grade Concentrated Dilute
1	Colour, Hasen units, Max	-	5
2	Colour after boiling for 4 hour under total reflux, Hazen Units, Max	-	10
3	Relative density at 27/27°C	-	1.1102 to 1.1107
4	Distillation range at 760 mm Hg a) Initial boiling point, °C Min b) The temperature at which 95 ml of material shall distil, °C	195 200	195.5 198.5
5	Moisture content, percent by mass, Max	0.3	0.2
6	Acidity (as acetic acid), percent by mass, Max	0.005	0.005
7	Ash, percent by mass, Max	0.005	0.005
8	Ultra-Violet transmittance in 1 cm cell at: a) 220 nm b) 275 nm c) 350 nm	- - -	60 percent 90 percent 98 percent
9	Freezing point of equal volumes of material and water, Max	-30°C	-
10	Iron content, ppm, Max	-	0.15
11	Chlorides content (as Cl), ppm, Max	-	0.3
12	Diethylene glycol content, percent by mass, Max	-	0.10

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
6048	5846	456	904

(IX) Aniline, Technical IS 2833: 1973, Reaffirmed 2016 (HS Code 29214110)

Used in dyes industry, rubber processing chemicals, herbicides. Aniline (C₆H₇N) finds extensive use in the dye industry. It is the starting material for many azo dyes. It is used in the manufacturer of other intermediates as acetanilide, acetoacetanilide, aminoazobenene, methyl aniline, diethyl aniline, dimethyl aniline etc. The dyes manufactured from impure Aniline have allergic effect to the skin of human beings, so it is imperative to make the standard mandatory to protect the human health.

The requirements of Aniline, Technical are described as under:

SI No.	Characteristic	Requirement
1	Relative density at 27°C/27°C	1.018 to 1.019
2	Crystallizing point, Min	-6.4°C
3	Distillation range	5 to 95 ml shall distil within the range of 1° C including 184°C
4	Assay, percent by mass, Min	99
5	Nitrobenzene content, ppm, Max	50
6	Moisture content, percent by mass, Max * Methods of sampling and tests for dye intermediates.	0.3

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
436	890	63	105

(X) Phosphoric Acid, Food Grade IS 10508: 2007, Reaffirmed 2013 (HS Code 28092010)

Food grade phosphoric acid used in food and beverages, cleaners, feed additives, soft drinks etc.

With the increased production of processed foods, manufactures have started adding a large number of substances, generally in small quantities, to improve the appearances, flavor, texture or storage properties of the processed foods. As impurities in these substances have been found to be harmful, it is necessary to have a strict quality control of these food additives. Phosphoric acid is used as an acidulant and is permitted under the Prevention of Food Adulteration Rules, 1955. This standard would help in checking purity which requires to be checked at the stage of manufacture, for it is extremely difficult (and in many cases impossible) to detect the impurity once these substances are added to the processed foods.

The requirements of Phosphoric Acid Food Grade are described as under:

SI No.	Characteristic	Requirement
1	Purity, as H ₃ PO ₄ , percent by mass, Min	85
2	Nitrates, mg/kg, Max	5
3	Volatile acids, mg/kg Max	10
4	Chlorides, mg/kg, Max	200
5	Sulphates percent by mass, Max	0.15
6	Fluoride, mg/kg, Max	10
7	Arsenic (as As), mg/kg, Max	2
8	Lead (as Pb), mg/kg, Max	5
9	Heavy metals, mg/kg, Max	10

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
9855	11173	2	3

(XI) Anhydrous Ammonia IS 662: 1980, Reaffirmed 2015 (HS Code 28141000)

Ammonia is converted into nitric acid which itself is used in the manufacture of fertilizers and explosives. Ammonia is also a useful ingredient in some cleaning fluids & is used for refrigeration purpose in the preparation of liquor ammonia.

The material shall be of two grades:

- a) Grade 1 – for refrigeration purpose and other uses where a relatively purer material is essential.
- b) Grade 2 – for miscellaneous industrial uses, such as for the manufacture of nitric acid, for the preparation of liquor ammonia.

The requirements of Anhydrous Ammonia are described as under:

SI No.	Characteristic	Requirement	
		Grade 1	Grade 2
1	Residue on evaporation percent by mass, Max	0.02	0.5
2	Moisture, percent by mass, Max	0.2	0-5
3	Oil, ppm by mass, Max	-	10

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
4741	5060	8	6

(XII) Sulphuric Acid IS 266: 1993, (Three revisions) (HS Code 28070010)

It is used in the manufacturer of superphosphate fertilizers, ammonium sulphate, synthetic detergents, dyes, pigments, explosive, Oleum, Nitric acid etc.

Sulphuric acid has is available in four grades:

- a) Technical (Tech)
- b) Battery Grade
- c) Chemically pure (CP)
- d) Analytical reagent (AR)

Imports of Sulphuric Acid takes place in high value. The undue excess impurity in sulphuric acid pass on to the fertilizers thus impacting yield and quality of the crop, ultimately having adverse effect on the human health.

The impurity profile of Sulphuric Acid is described as under:

SI No.	Characteristic	Requirement				
		Technical Grade	Battery Grade		Chemically Pure Grade	Analytical Reagent Grade
			Concentrated	Dilute		
1	Total acidity (as H ₂ SO ₄)	98.0	95.0	30.0	30.0	98.0
2	Residue on ignition, percent by mass, Max	0.2	0.06	0.02	0.01	0.002
3	Iron (as Fe), percent by mass, Max	0.05	0.003	0.0001	0.001	0.00005 (0.5ppm)
4	Chlorides (as Cl), percent by mass, Max	-	0.001	0.0003 (3 ppm)	0.0035	0.00002 (0.2 ppm)
5	Lead (as Pb), percent by mass, Max	0.005	-	-	0.002	0.0001 (1 ppm)
6	Arsenic (as As), percent by mass, Max	0.004	0.00012 (1.2 ppm)	0.00004 (0.4 ppm)	0.0002 (2 ppm)	0.000005 (0.05 ppm)
7	Oxidizable impurities (as SO ₂), percent by mass, Max	-	0.02	0.02	0.004	0.0004 (4 ppm)
8	Organic matter	-	To pass test	-	-	-
9	Nitrates (as NO ₃), percent by mass, Max	-	-	-	-	0.00002 (0.2 ppm)
10	Ammonia (as NH ₂), percent by mass, Max	-	-	-	-	0.0002 (2 ppm)
11	Selenium (as Se), percent by mass, Max	-	0.002	0.0006 (6 ppm)	-	-
12	Manganese (as Mn), percent by mass, Max	-	0.0001 (1 ppm)	0.00003 (0.3 ppm)	-	-

13	Copper (as Cu), percent by mass, Max	-	0.003	0.001	-	-
14	Zinc (as Zn), percent by mass, Max	-	0.003	0.001	-	-
15	Nitrates, nitrites and ammonia (as N), percent by mass, Max	-	0.003	0.001	0.003	-

Its import-export data is as under:

Imports (Rs in Crores)		Exports (Rs in Crores)	
2016-17	2017-18	2016-17	2017-18
233	219	38	101
