REGULATIONS – PRESERVATIVES AND ANTIOXIDANTS

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The Minister of Health, Welfare and Pensions has, in terms of section 15(1) of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972), made the following regulation which may be applied from the date of publication hereof but shall be applied with effect from a date six months after the date of publication.

Definitions

(1) **"Antioxidant"** means any substance which delays, retards or prevents the development in foodstuffs of rancidity or other deterioration due to oxidation but does not include substances added to foodstuffs for purposes other than antioxidation which nevertheless have an antioxidant action;

"good manufacturing practice (GMP)" means limited to such a maximum level that the product concerned will not be deleteriously affected or its compliance with legal requirements disturbed; and

"preservative" means any substance which inhibits, retards or arrests fermentation, acidification or other decomposition of foodstuffs but does not include preservatives such as common salt (sodium chloride), sugar (sucrose) lactic acid, vinegar, alcohol or potable spirits, herbs, hop extract, spices and essential oils.

(2) (a) Any person shall be guilty of an offence if he sells any foodstuff which contains a preservative, except that each foodstuff specified in column I of Annex A or any such foodstuff which is intended to be diluted or reconstituted before consumption, when diluted or reconstituted in accordance with the instructions on the label, may, subject to the provisions of subregulation (2)(b), contain any one of the preservatives specified opposite to it in column II, in a proportion not exceeding the number of mg/kg or mg/1, as the case may be, specified in column III. The preservatives sulphur dioxide, benzoic acid, sorbic acid and propionic acid may also be used in the form of their calcium, sodium or potassium salts expressed as sulphur dioxide (SO_2), benzoic acid (C_6H_3COOH), sorbic

acid ($CH_3 - CH = CH - CH = CH - COOH$) and propionic acid ($CH_3CH_2COOH$), as the case may be.

(b) Where the use of two or more preservatives in a foodstuff is allowed in Annex A, a mixture thereof, if compatible, may be used, provided the sum of the fractions obtained when the amount of each preservative used is divided by the maximum permitted amount of such preservative when used alone does not exceed one.

(c) A preservative shall not contain—

(i) more than 3 mg/kg of arsenic;

(ii) more than 10 mg/kg of lead;

(iii) more than 50 mg/kg of copper and zinc taken together (the zinc content, however, shall not be higher than 25 mg/kg);or

(iv) any other substances harmful to human health, subject always, however, to any exceptions implicit in the specific criteria laid down in Annex C. Where Specific Criteria of Purity are laid down in Annex C, these shall apply.

(3) (a) Subject to the provisions of the regulations governing (a) wine, other fermented beverages and spirits and (b) foodstuffs for infants, young children and children, no person shall sell any foodstuff containing an antioxidant, except that each foodstuff specified in column I of Annex B or any such foodstuff which is intended to be diluted or reconstituted before consumption, when diluted or reconstituted in accordance with the instructions on the label, may, subject to the provisions of subregulation (3)(b), contain any of the antioxidants specified opposite to it in column II, in a proportion not exceeding the number of milligrams per kilogram or per litre specified in column III.

(b) Where the use of two or more antioxidants in a foodstuff is allowed in Annex B, a mixture thereof, if compatible, may be used, provided the sum of the fractions obtained when the amount of each antioxidant used is divided by the maximum permitted amount of such antioxidant, when used alone does not exceed one.

(c) An antioxidant shall not contain—

(i) more than 3 mg/kg of arsenic

(ii) more than 10 mg/kg of lead;

(iii) more than 50 mg/kg of copper and zinc taken together (the zinc content, however, shall not be higher than 25 mg/kg); or

(iv) any other substances harmful to human health.

(4) Foodstuffs prepared in part from foodstuffs in which no preservative or antioxidant is permitted, and in part from foodstuffs in which a preservative or antioxidants is permitted, shall not contain more preservative or antioxidant than results from the addition of the foodstuff in which a preservative or antioxidant is permitted.

(5) Every package containing a preservative or antioxidant intended to be used in food shall bear a label stating clearly its composition and, in the case of sulphur dioxide compounds, the percentage of sulphur dioxide which the contents will yield.

(6) No person shall advertise, sell or use as a preservative or antioxidant for foodstuffs any preservative or antioxidant which is not specified in column II of either Annex A or B, as the case may be.

(7) Where the process of smoking is applied or where a smoke solution is added, the smoke or smoke solutions shall be derived from wood or ligneous vegetable matter in the natural state. Smoke or smoke solutions derived from wood of ligneous vegetable matter which has been impregnated,

coloured, gummed, painted, coated or treated in any manner liable to import substances harmful to human health are not permissible.

Regulation 5 of the regulations under the repealed Food, Drugs and Disinfectants Act, 1929 (Act 13 of 1929), published under Government Notice 575 of 28 March 1930, as amended, is hereby repealed with effect from the date of coming into effect of the provisions of this notice.

ANNEXURE A

I Foodstuff	II Preservative	III Quantity permitted mg/kg or mg/P
All foodstuffs where applicable	Lysozyme	600
Coffee extract (or coffee and chicory extract), liquid	Methul-p-hydroxy benzoate	1 000
	Propyl-p-hydroxy benzoate	1 000
	Sorbic acid	600
Coffee extract, solid	Sulphur dioxide	500
Desserts:	Sulphur dioxide	500
Refrigerated	Sorbic acid	1 000
Non-refrigerated table jelly	Benzoic acid	400
Desserts, refrigerated	Sorbic acid	400
Dietary supplements	Sorbic acid	1 000
Essences and colour solutions for household use	Parahydroxybenzoic acid and its salts	*GMP
	Benzoic acid	1 000
Flour confectionery	Parahydroxybenzoic acid, methyl and propyl esters	1 000
	Propionic acid	1 000
	Sodium metabisulphite	100 (calculated as sulphur dioxide)
Fruit: Crystallised glacé or cured fruit and candied peel	Sorbic acid	1 000
Dried fruit, including raisins and sultanas	Sulphur dioxide	100
	Sulphur dioxide	2 000
	Sorbic acid	600

I Foodstuff	II Preservative	III Quantity permitted mg/kg or mg/P
Fresh fruit, prepared	Benzoic acid	600
	Sorbic acid	600
	Sulphur dioxide	500
Fresh fruit pulp	Benzoic acid	600
	Pimaricin	5
	Sorbic acid	600
	Sulphur dioxide	1 500
Glazed fruit	Sorbic acid	400
Gelatin, edible	Sulphur dioxide	1 000
Jam and marmelade:		
Artificially sweetened jam substitutes	Benzoic acid	400
	Sorbic acid	400
	Sulphur dioxide	40
Jam, fruit preserves and jellies	Sulphur dioxide	40
	Benzoic acid	400
	Parahydroxybenzoic acid, methyl and propyl esters	400
	Sorbic acid	400
	Sulphur dioxide	40
Citrus marmalade	Sorbic acid	250
	Benzoic acid	1 000
Margarine and other edible fat and oil emulsions	Benzoic acid	1 000
	Sorbic acid	1 000
Marine food:		
Caviar (sturgeon eggs) and other fish eggs, not smoked	Hexamethylenetetramine	1 000 when product is marketed
Fish pastes	Benzoic acid	500
	Sorbic acid	500
	Methyl-p-hydroxybenzoate	1 000
	Propyl-p-hydroxybenzoate	1 000
	Pimaricin	6
Fish roe and spawn which has been cooked, cured and/or smoked	Benzoic acid	750
	Pimaricin	6
Fish sausages	Benzoic acid	700
	Pimaricin	6 to be applied to the outer inedible casing only
	Sulphur dioxide	450
Fish, smoked and dried	Benzoic acid	200
	Sorbic acid	600
Fresh fish	Benzoic acid	100
	Sorbic acid	GMP
Manufactured fish products, with the exception of frozen fish, salted snoek and canned fish products	Benzoic acid	700
	Pimaricin	6
	Sulphur dioxide	450
Marinated fish and fish products to be kept under refrigeration	Benzoic acid	1 000
	Ethyl 4-hydroxybenzoate	1 000
	Hexamine	50
	Methyl 4-hydroxybenzoate	1 000
	Propyl 4-hydroxybenzoate	1 000

I Foodstuff	II Preservative	III Quantity permitted mg/kg or mg/ℓ
Quick frozen lobsters	Sulphur dioxide	30 in the raw product
	Pimaricin	6
Quick frozen shrimps or prawns (raw product)	Sulphur dioxide	30 in the final product
Salted snoek	Sorbic acid	10 000
Mayonnaise, salad cream, salad dressing and French dressing	Sorbic acid	600
	Benzoic acid	600
Meat products:		
Biltong	Pimaricin	6
	Potassium and sodium nitrate	200 total nitrate, expressed as sodium nitrate
	Potassium and sodium nitrite	160 total nitrate, expressed as sodium nitrate
	Sorbic acid	2 000
Canned chopped meat	Potassium and sodium nitrate	200 total nitrate, expressed as sodium nitrate
	Potassium and sodium nitrate	50 total nitrate, expressed as sodium nitrate
	Pimaricin	6
Canned corned beef	Potassium and sodium nitrate	200 total nitrate, expressed as sodium nitrate
	Potassium and sodium nitrate	50 total nitrate, expressed as sodium nitrate
	Pimaricin	6
Cold, smoked, manufactured sausages	Sorbic acid	400
	Pimaricin	6
	Potassium and sodium nitrate	200 total nitrate, expressed as sodium nitrate
Cooked cured hams	Potassium and sodium nitrate	160 total nitrate, expressed as sodium nitrate
	Pimaricin	6
Cooked cured luncheon meat	Potassium and sodium nitrate	200 total nitrate, expressed as sodium nitrate
	Potassium and sodium nitrate	160 total nitrate, expressed as sodium nitrate
	Pimaricin	6
Cooked cured pork shoulder	Potassium and sodium nitrate	200 total nitrate, expressed as sodium nitrate
	Potassium and sodium nitrate	160 total nitrate, expressed as sodium nitrate
	Pimaricin	6
Frozen cooked meat pie fillings	Sorbic acid	400
	Pimaricin	6
Meat pasties, frozen, raw	Sorbic acid	400
Manufactured meat products, with the exception of canned meat products	Potassium and sodium nitrate	160 total nitrate, expressed as sodium nitrate
	Potassium and sodium nitrate	200 total nitrate, expressed as sodium nitrate
	Sulphur dioxide	450

I Foodstuff	II Preservative	III Quantity permitted mg/kg or mg/P
	Benzoic acid	750
	Pimaricin	500 on the casing, 6 in the contents
Processed meat products	Potassium and sodium nitrate	160 total nitrate, expressed as sodium nitrate
	Potassium and sodium nitrate	200 total nitrate, expressed as sodium nitrate
Sausages and sausage meat	Sulphur dioxide	450
	Benzioc acid	750
	Pimaricin	500 on the casing, 6 in the contents
Milk products:		
Cheddar cheese, Cheshire cheese	Pimaricin	2 in the rind without plastic coating; 500 in a plastic coating; 10 for application on the surface of the cheese only
	Sorbic acid	1 000
Cheese (except as otherwise specified)	Benzoic acid	Carried over from enzyme preparations
	Calcium sorbate	Carried over from enzyme preparations
	Hexamethylenetetramine	*GMP
	Hydrogen peroxide	Not specified (residue destroyed by using catalase)
	Nisin (pure)	12,5 equivalent to 500 i.u.g finished product
	Pimaricin	2 in the rind without plastic coating; 500 in a plastic coating; 10 for application to the surface of the cheese only
	Potassium and sodium nitrates	200 singly or in combination calculated as sodium nitrate
	Propionic acid	*GMP
	Sulphurdioxide	2 000
Cottage cheese and cream cheese	Sorbic acid	1 000
	Pimaricin	10
Hard grating cheese	Pimaricin	2 in the rind without plastic coating; 500 in a plastic coating; 10 for application on the surface of the cheese only
	Sorbic acid	3000
Processor blended cheese including cheese spread process cheese preparations and soft cheese	Benzoic acid	600
	Nisin (pure)	12,5 equivalent to 500 i.u.g finished product
	Pimaricin	10 for application to the surface of the cheese only
	Propionic acid and its Ca. K na. salts	1 000
	Sodium Diacetate	1 500
	Sorbic acid	1 000

I Foodstuff	II Preservative	III Quantity permitted mg/kg or mg/P
Various cheeses (Edam, Gouda, Tilsuer, Lenburger)	Pimaricin	2 in the rind without plastic coating: 500 in a plastic coating: 10 for application to the surface of the cheese only
	Potassium and sodium nitrates	200 singly or in combination calculated as sodium nitrate
Yoghurt	Sorbic acid	1 000
	Pimaricin	10
Pastry (dough), raw, frozen	Sorbic acid	400
Pickles, sauces and chutneys:		
Pickled cucumbers	Benzoic acid	1 000
	Sorbic acid	1 000
Pickles (excluding pickled cucumbers), sauces, chutneys, tomato ketchup paste, pulp and puree	Methyl-p-hydroxy benzoate	1 000
	Propyl-p-hydroxy benzoate	1 000
	Sorbic acid	600
	Sulphur dioxide	500
	Benzoic acid	600
Table olives, including stuffed olives or specialities that are either not fully cured or are not preserved by heat sterilization	Benzoic acid	1 000
	Sorbic acid	500
	Formaldehyde	280
Silicon antifoam emulsion	Sorbic acid	1 000
Soft drinks and beverages:		
Beverage concentrates, prepared from wheat and other cereals	Benzoic acid	600
Black currant juice	Sulphur dioxide	10
	Pimaricin	5
Soft drinks	Sulphur dioxide	120
	Benzoic acid	400
	Sorbic acid	250
Fruit juices, not otherwise specified	Benzoic acid	600
	Propyl-p-hydroxy benzoate	1 000
	Methyl-p-hydroxy benzoate	1 000
	Sulphur dioxide	450
	Sorbic acid	600
	Pimaricin	5
Pineapple juice	Sulphur dioxide	10
	Pimaricin	5
Sacramental wine prepared from unfermented grape juice	Benzonic acid	2 750
	Pimaricin	5
Starches, including modified starches	Sulphur dioxide	100
Sugars and syrups:		
Liquid glucose	Sulphur dioxide	400
Dextrose anhydrous	Sulphur dioxide	20
Dextrose monohydrate	Sulphur dioxide	20
Powered glucose for the manufacture of sugar confectionery only	Sulphur dioxide	150

I Foodstuff	II Preservative	III Quantity permitted mg/kg or mg/P
Glucose syrup and powered glucose.	Sulphur dioxide	40
Liquid glucose for the manufactured sugar confectionery only	Sulphur dioxide	400
Powdered dextrose	Sulphur dioxide	20 (residue resulting from the dextrose used)
Powdered sugar	Sulphur dioxide	20 (residue resulting from the white sugar used)
Refined sugar	Sulphur dioxide	20
Soft sugars	Sulphur dioxide	40
Vegetables, dehydrated	Sulphur dioxide	2 000
Vegetables, fresh, prepared	Sulphur dioxide	500
Vinegar	Sulphur dioxide	100
Canned foodstuffs, not otherwise specified	Pimaricin	5

*GMP means good manufacturing practice.

ANNEXURE B

I Foodstuff	II Antioxidant	III Maximum level mg/kg or mg/P
Chewing gum base	Butylated hydroxyanisole (BHA)	1 000
	Butylated hydroxytoluene (BHT)	1 000
	Propyl gallate	100
Dietary supplements	Butylated hydroxyanisole (BHA)	*GMP
	Alphatocopherol	*GMP
	Tocopherols, mixed concentrate	
Essential oils	Butylated hydroxyanisole (BHA)	1 000
	Butylated hydroxytoluene (BHT)	1 000
Fat and oils:		
Butterfat not intended for direct consumption or use in reconstituted milk or reconstituted milk products	Butylated hydroxyanisole (BHA)	200
	Butylated hydroxytoluene (BHT)	200
	Propyl. octyl and dodecyl gallates	100
	Tertiary butylhydroquinone (TBHQ)	200
Low eruric acid rapeseed oil, edible fats and oils, excluding butterfat and margarine	Ascorbyl palmitate and stearate	200
	Butylated hydroxyanisole (BHA)	200
	Butylated hydroxytoluene (BHT)	200
	Propyl. octyl and dodecyl gallates	100
	Tertiary butylhydroquinone (TBHQ)	200
	Phosphoric acid	100
	Isopropyl citrate mixture (including monoisopropyl citrate)	
	Monoglyceride citrate	
	Thiodipropionate, dilauryl	200
	Citric acid, sodium citrate	*GMP
	Alpha tocopherol	
	Tocopherols, mixed concentrate	
Margarine	Ascorbyl palmitate and stearate	200
	Butylated hydroxyanisole (BHA)	200
	Butylated hydroxytoluene (BHT)	200
	Propyl, octyl and dodecyl gallates	100
	Tertiary butylhydroquinone (TBHQ)	200
	Isopropyl citrate mixture (including monoisopropyl citrate)	100
	Alpha-Tocopherol, tocopherols, mixed concentrate	*GMP
Refined olive oil, refined olive-residue oil and blends of virgin and refined olive oils and mixtures of virgin and refined olive-residue oils	Alpha-Tocopherol	200 total alpha-tocopherol for the purposes of restoring natural tocopherol lost in processing

I Foodstuff	II Antioxidant	III Maximum level mg/kg or mg/P
Flavourants	Alpha-Tocopherol Tocopherols, mixed concentrate	*GMP
Fruit and fruit juices:		
Fruit juices, fruit nectars, fruit squashes, fruit drinks and imitation fruit drinks, as defined in the Marketing Act, 1968 (Act 59 of 1968) or in the specifications contained in the regulations under that Act.	Erythorbic acid/sodium erythorbate L-Ascorbic acid	*GMP *GMP
Canned apple sauce, canned fruit cocktail, canned peaches, canned tropical fruit salad, fresh prepared fruit, frozen cherries, quick frozen peaches and quick frozen strawberries	Erythorbic acid/sodium erythorbate L-Ascorbic acid	*GMP *GMP
Dried fruit	Erythorbic acid/sodium erythorbate	*GMP
Quick frozen fruit salad	Citric acid Erythorbic acid/sodium erythorbate L-Ascorbic acid	150 *GMP *GMP
Fungi and fungus products	L-Ascorbic acid	*GMP
Jam and marmalade:		
Jams, fruit preserves and jellies	Erythorbic acid/sodium erythorbate L-Ascorbic acid	*GMP 500
Marmalade	Erythorbic acid/sodium erythorbate L-Ascorbic acid	*GMP 500
Malt beverage (including ales, lagers and stouts)	L-Ascorbic acid	Not greater than 20 as ascorbic acid
	Sodium ascorbate Sodium iso-ascorbate Sulphur dioxide	Free sulphur dioxide not to exceed 20
Marine food:		
Any edible fish species canned in tomato-based sauces	Sodium metabisulphite	30 in the final product, expressed as SO_2, singly or in combination with other sulphites

I Foodstuff	II Antioxidant	III Maximum level mg/kg or mg/P
Canned lobster meat or crabmeat	Ethylenediaminetetraacetic acid, calcium disodium salt	275
	Sodium bisulphite	30 in the final product, expressed as SO_2, singly or in combination with other sulphites
	Sodium metabisulphite	30 in the final product, expressed as SO_2, singly or in combination with other sulphites
Canned shrimps or prawns	Ethylenediaminetetraacetic acid, calcium disodium salt	250
	Sodium bisulphite	30 in the final product, expressed as SO_2, singly or in combination with other sulphites
	Sodium metabisulphite	30 in the final product, expressed as SO_2, singly or in combination with other sulphites
Frozen blocks of hake fillets or hake mince	Ascorbic acid	1 000
	Citric acid	1 000
	Ethyl and propyl gallates	100
	L-Ascorbic acid	*GMP
Frozen rock lobster tails	Sodium bisulphite	30 in the final product, expressed as SO_2, singly or in combination with other sulphites
Maasbanker canned in tomato based sauces	Sodium metabisulphite	30 in the final product, expressed as SO_2, singly or in combination with other sulphites
Quick frozen fillets of cod, haddock, flat fish, hake and ocean perch	Erythorbic acid/sodium erythorbate	1 000
	L-Ascorbic acid, K and/or Na salts thereof	1 000 in the final product, expressed as ascorbic acid (from potassium or sodium ascorbate)
Quick frozen shrimps or prawns (raw products)	Erythorbic acid/sodium erythorbate	*GMP
	L-Ascorbic acid	*GMP
	Sodium bisulphite	30 in the final product, expressed as SO_2, singly or in combination with other sulphites
	Sodium metabisulphite	30 in the final product, expressed as SO_2, singly or in combination with other sulphites

I Foodstuff	II Antioxidant	III Maximum level mg/kg or mg/P
Meat products:		
Bacon	Erythorbic acid/sodium erythorbate	550
	L-Ascorbic acid	550
Biltong	Pimaricin	6
	Potassium and sodium nitrate	200 total nitrate, expressed as sodium nitrate
	Potassium and sodium nitrate	160 total nitrate, expressed as sodium nitrate
	Sorbic acid	2 000
Manufactured meat products including sausages (species and mixed species)	Erythorbic acid/sodium erythorbate	*GMP
Processed meat products	Erythorbic acid/sodium erythorbate	*GMP
Simulated meat cuts i.e. comminuted or chopped raw meat which has been shaped to simulate certain meat cuts	Ascorbic acid	*GMP
Non-dairy creamer	Butylated hydroxyanisole (BHA)	200
	Butylated hydroxytoluene (BHT)	200
	Tertiary butylhydroquinone (TBHQ)	200
Soft drinks other than fruit drinks and imitation fruit drinks as defined in the Marketing Act, 1968 (Act 59 of 1968)	Stannous chloride	25, expressed as Sn
Vegetables:		
Canned asparagus	L-Ascorbic acid	*GMP
Canned asparagus in glass or fully enamel-lined (lacquered) containers	Stannous chloride	25, expressed as Sn
Canned mushrooms	L-Ascorbic acid	*GMP
	Ethylenediaminetetraacetic acid, calcium disodium salt	200
Prepared fresh vegetables	L-Ascorbic acid	*GMP

* GMP means good manufacturing practice.

ANNEXURE C

SPECIFIC CRITERIA OF PURITY OF PRESERVATIVES

GENERAL OBSERVATIONS

(a) Save as otherwise stated, quantities and percentages are calculated by mass on the anhydrous substance.

(b) Where the relevant substance is initially not anhydrous and "volatile substances" are involved, water is included among these substances.

(c) Where the drying period is not specified, this means "dried to constant mass".

BENZOIC ACID

Appearance.....	White crystalline powder.
Melting range.....	121,5 – 123,5 °C, after vacuum drying in a sulphuric acid desiccator.
Content.....	Not less than 99,5 per cent.
Sulphated ash.....	Not more than 0,05 per cent.
Polycyclic acids.....	On fractional acidification of a neutralised solution of benzoic acid, the first precipitate shall not have a different melting point from that of benzoic acid.
Organic chlorine.....	Not more than 0,07 per cent corresponding to 0,3 per cent expressed as monochlorobenzoic acid.
Readily oxidisable substances.....	Pink colour maintained with not more than 0,5 ml of $KMnO_4$ (0,1N) per g in sulphuric acid solution (0,1N) after one hour, at room temperature.
Sulphuric acid tst.....	A cold solution of 0,5 g of benzoic acid in 5 ml of 94,5 – 95,5 per cent sulphuric acid should not show a stronger colouring than that of a reference liquid containing 0,2 ml of cobalt chloride TSC*, 0,3 ml of ferric chloride TSC≅, 0,1 ml of copper sulphate TSCA and 4,4 ml of water.

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*Cobalt chloride TSC: Dissolve approximately 65 g of cobalt chloride $CoCl_2\ 6H_2O$ in a sufficient quantity of a mixture of 25 ml hydrochloric acid and 975 ml of water to give a total volume of 1P. Place exactly 5 ml of this solution in a 250 ml round bottomed iodine flask, add 5 ml of 3 per cent hydrogen peroxide, then 15 ml of a 20 per cent solution of sodium hydroxide. Boil for 10 minutes, allow to cool, add 2 g of potassium iodide and 20 ml of 25 per cent sulphuric acid. After the precipitate is completely dissolved, titrate the liberated iodine with sodium thiosulphate (0,1N) in the presence of starch TS. § 1 ml of sodium thiosulphate (0,1N) corresponds to 23,80 mg of $CoCl_2\ 6H_2O$. Adjust final volume of solution by the addition of a sufficient quantity of the hydrochloric acid/water mixture to give a solution containing 59,5 mg of $CoCl_2\ 6H_2O$ per ml.

≅Ferric chloride TSC: Dissolve approximately 55 g of ferric chloride in a sufficient quantity of a mixture of 25 ml of hydrochloric acid and 975 ml of water to give a total volume of 1P. Place 10 ml of this solution in a 250 ml round-bottomed iodine flask, add 15 ml of water and 3 g of potassium iodide: leave the mixture to stand for 15 minutes. Dilute with 100 ml of water then titrate the liberated iodine with sodium thiosulphate (0,1N) in the presence of starch TS. § 1 ml of sodium thiosulphate (0,1N) corresponds to 27,03 mg $FeCl_3 6H_2O$. Adjust the final volume of the solution by the addition of a sufficient quantity of the hydrochloric acid/water mixture to give a solution containing 45,0 mg of $FeCl_3 6H_2O$ per ml.

ACopper sulphate TSC: Dissolve approximately 65 g of copper sulphate $CuSO_4 5H_2O$ in a sufficient quantity of a mixture of 25 ml of hydrochloric acid and 975 ml of water to give a total volume of 1P. Place 10 ml of this solution in a 250 ml round-bottomed iodine flask, add 40 ml of water, 4 ml of acetic acid and 3 g of potassium iodide. Titrate the liberated iodine with sodium thiosulphate (0,1N) in the presence of starch

T S. § 1 ml of sodium thiosulphate (0,1N) corresponds to 24,97 mg of $CuSO_4 5H_2O$. Adjust the final volume of the solution by the addition of a sufficient quantity of the hydrochloric acid water mixture to give a solution containing 62,4 mg of $CuSO_4 5H_2O$ per ml.

§Starch TS: Triturate 0,5 g starch (potato, maize or soluble starch) with 5 ml of water; to the resulting paste add a sufficient quantity of water to give a total volume of 100 ml stirring all the time. Boil for a few minutes, allow to cool, filter. The starch solution should be freshly prepared.

CALCIUM BENZOATE

Appearance	White crystalline powder.
Melting range of benzoinc acid isolated by acidification and not recrystallised	121,5 – 123,5 °C after vacuum drying in a sulphuric acid desiccator.
Content	Not less than 99 per cent, after drying at 105 °C.
Volatile substances	Not more than 17,5 per cent, determined by drying at 105 °C.
Polycyclic acids	On fractional acidification of a (neutralised) solution of calcium benzoate, the first precipitate shall not have a different melting range from that of benzoic acid.
Organic chlorine	Not more than 0,06 per cent, corresponding to 0,25 per cent expressed as mono-chlorobenzoic acid.
Readily oxidisable substances	Pink colour maintained with not more than 0,5 ml of $KMnO_4$ (0,1N) per g in sulphuric acid solution (0,1N) after one hour, at room temperature.
Degree of acidity or alkalinity	Neutralisation of 1 g of calcium benzoate in the presence of phenolphthalein shall not require more than 0,25 ml of NaOH (0,1N) or HCl (0,1N).

CALCIUM METABISULPHITE

Appearance	White powder or yellowish lumps.
Content	Not less than 95 per cent of CaS_2O_5 and not less than 66 per cent of SO_2.
Iron	Not more than 35 mg/kg of Fe.
Selenium	Not more than 10 mg/kg based on the SO_2 content.

CALCIUM PROPIONATE

Appearance	White crystalline powder.
Content	Not more than 99 per cent, after drying for two hours at 105 °C.
Volatile substances	Not more than 4 per cent, determined by drying for two hours at 105 °C.
Water insolubles	Not more than 0,3 per cent.
Readily oxidisable substances	No trace.
Iron	Not more than 30 mg/kg.

CALCIUM SORBATE

Appearance	Fine white crystalline powder showing no change in colour after heating for ninety minutes at 105 °C.
Melting range of sorbic acid isolated by acidification and not recrystallised	133 – 135 °C, after vacuum drying in a sulphuric acid desiccator.
Content	Not less than 98 per cent, after vacuum drying for four hours in a sulphuric acid desiccator.
Volatile substances	Not more than 2 per cent, determined by vacuum drying in a sulphuric acid desiccator.

Aldehydes	Not more than 0,1 per cent, calculated as formaldehyde.

HEXAMETHYLENETETRAMINE

Appearance	Colourless or white crystalline powder.
Content	Not less than 99 per cent $C_4H_{12}N_4$.
Loss on drying	Not more than 0,5 per cent after drying at 105 °C in vacuum over phosphorous pentoxide for two hours.
Sublimation point	Sublimes at about 260 °C.
Sulphated ash	Not more than 0,05 per cent.
Sulphates	Not more than 0,005 per cent, expressed as SO_4.
Chlorides	Not more than 0,005 per cent expressed as Cl.

LYSOZYME

Appearance	White odourless powder with a somewhat sweet taste.
Solubility	Freely soluble in water; insoluble in com-mon organic solvents.
Specifications:	
Nitrogen	16 – 17 per cent.
Chloride	not more than 0,3 per cent.
Humidity	not more than 4 per cent.
Ash	not more than 0,3 per cent.
Acticity	not less than 22 500 units/mg.
Bacterial count	not more than 100 viable organisms/g.
Heavy metals	not more than 5 mg/kg.
Arsenic	not more than 2 mg/kg.

N-PROPYL P-HYDROXYBENSOATE

Appearance	White crystalline powder.
Melting point	95 – 97 °C after drying for two hours at 80 °C.
Content	Not less thabn 99,5 per cent, after drying for two hours at 80 °C.
Sulphate ash	Not more than 0,05 per cent.
Free acids	Not more than 0,35 per cent, expressed as p-hydroxybenzoic acid.

POTASSIUM BENZOATE

Appearance	White crystalline powder.
Melting range of benzoic acid isolated by acidification and not recrystallised	121,5 – 123,5 °C, after vacuum drying in a sulphuric acid desiccator.
Content	Not less than 99 per cent, after drying at 105 °C.
Volatile substances	Not more than 26,5 per cent, determined by drying at 105 °C.
Polycyclic acids	On fractional acidification of a (neutralised) solution of potassium benzoate the first precipitate shall not have a different melting range from that of benzoic acid.
Organic chlorine	Not more than 0,06 per cent, corresponding to 0,25 per cent expressed as mono-chlorobenzoic acid.
Readily oxidisable substances	Pink colour maintained with not more than 0,5 ml of $KMnO_4$ (0,1N) per g in sulphuric acid solution (0,1N) after one hour, at room temperature.
Degree of acidity or alkalinity	Neutralisation of 1 g of potassium benzoate in the presence of phenolphthalein shall not require more than 0,25 ml of NaOH (0,1N) or HCl (0,1N).

POTASSIUM METABISULPHITE

Appearance	Colourless crystals or white crystalline powder.
Content	Not less than 95 per cent of $K_2S_2O_5$, and not less than 54,7 per cent of SO_2.
Iron	Not more than 30 mg/kg of Fe.
Selenium	Not more than 10 mg/kg based on the SO_2 content.

POTASSIUM NITRATE

Appearance	White or slightly yellow deliquescent granules.
Content	Not less than 95 per cent after drying for four hours over silica gel.
pH (5 per cent solution in carbon dioxide-free and ammonia-free water)	Not less than 6,0 and not more than 9,0.

POTASSIUM SORBATE

Appearance	White crystalline powder showing no change in colour after heating for 90 minutes at 105 °C.
Melting range of sorbic acid isolated by acidification and not recrystallised	133 – 135 °C, after vacuum drying in a sulphuric acid desiccator.
Content	Not less than 99 per cent, after vacuum drying for four hours in a sulphuric acid desiccator.
Volatile substances	Not more than 1 per cent, determined by vacuum drying in a sulphuric acid desiccator.
Aldehydes	Not more than 0,1 per cent, calculated as formaldehyde.

PROPIONIC ACID*

Appearance	Colourless or slightly yellowish liquid.
Content	Not less than 99 per cent.
Non-volatile substances	Not more than 0,05 per cent.
Aldehydes	Not more than 0,1 per cent, expressed as formaldehyde.
Iron	Not more than 30 mg/kg.

SODIUM BENZOATE

Appearance	White crystalline powder.
Melting range of benzoic acid isolated by acidification and not recrystallised	121,5 – 123,5 °C, after vacuum drying in a sulphuric acid desiccator.
Content	Not less than 99,5 per cent, after drying for four hours at 105 °C.
Volatile substances	Not more than 1 per cent, determined by drying for four hours at 105 °C.
Polycyclic acids	On fractional acidification of a (neutralised) solution of sodium benzoate, the first precipitate shall not have a different melting range from that of benzoic acid.
Organic chlorine	Not more than 0,06 per cent, corresponding to 0,25 per cent, expressed as mono-chlorobenzoic acid.
Readily oxidisable substances	Pink colour maintained with not more than 0,5 ml of $KMnO_4$ (0,1N) per g in sulphuric acid solution (0,1N) after one hour, at room temperature.
Degree of acidity of alkalinity	Neutralisation of 1 g of sodium benzoate, in the presence of phenolphthalein, shall not require more than 0,25 ml of NaOH (0,1N) or HCl (0,1N).

SODIUM METABISULPHITE

Appearance	Colourless crystals or white crystalline powder.
Content	Not less than 95 per cent of $Na_2S_2O_5$ and not less than 64 per cent of SO_2.
Iron	Not more than 35 mg/kg of Fe.
Selenium	Not more than 10 mg/kg, based on the SO_2 content.

SODIUM NITRATE

Appearance	White crystalline slightly hygroscopic powder.
Content	Not less than 99 per cent, after drying at 105 °C.
Volatile substances	Not more than 1 per cent, determined by drying at 105 °C.
Nitrites	Not more than 30 mg/kg, expressed as $NaNO_2$.

SODIUM NITRITE

Appearance	White crystalline powder or yellowish lumps.
Content	Not less than 98 per cent, after vacuum drying in a sulphuric acid desiccator, the remainder shall consist almost entirely of sodium nitrite.
Water	Not more than 1 per cent.

SODIUM N-PROPYL P-HYDROXYBENZOATE

Appearance	White or almost white crystalline hygroscopic powder.
Melting range of ester isolated by acidification and not recrystallised	94 – 97 °C, after vacuum drying in a sulphuric acid desiccator.
Content: Propyl ester of p-hydrocybenzoic acid	Not less than 85 per cent, after vacuum drying in a sulphuric acid desiccator.
Volatile substances	Not more than 5 per cent, determined by vacuum drying in a sulphuric acid desiccator.
Sulphated ash	34 per cent to 36 per cent.
pH	pH of 0,1 per cent aqueous solution shall be between 9,8 and 10,2.
Salicyclic acid	Not more than 0,1 per cent.

SODIUM PROPIONATE

Appearance	White crystalline powder.
Content	Not less than 99 per cent, after drying for two hours at 105 °C.
Volatile substances	Not more than 4 per cent, determined by drying for two hours at 105 °C.
Water insolubles	Not more than 0,3 per cent.
Readily oxidisable substances	No trace.
Iron	Not more than 30 mg/kg.

SODIUM SORBATE

Appearance	White crystalline powder showing no change after heating for 90 minutes at 105 °C.
Melting range of sorbis acid isolated by acidification and not recrystallised	133 – 135 °C, after vacuum drying in a sulphuric acid desiccator.
Content	Not less than 99 per cent, after vacuum drying for four hours in a sulphuric acid desiccator.

Volatile substances	Not more than 1 per cent, determined by vacuum drying in a sulphuric acid desiccator.
Aldehydes	Not more than 0,1 per cent, calculated as formaldehyde.

SODIUM SULPHITE
(anhydrous or heptahydrate)

Appearance	White crystalline powder or colourless crystals.
Content: Anhydrous	Not less than 95 per cent of NaS_2O_3 and not less than 48 per cent of SO_2.
Heptahydrate	Not less than 48 per cent of NaS_2O_3 and not less than 24 per cent of SO_2.
Thiosulphate	Not more than 0,1 per cent of NaS_2O_3 based on the SO_2 content.
Iron	Not more than 50 mg/kg expressed as Fe, based on the SO_2 content.
Selenium	Not more than 10 mg/kg, based on the SO_2 content.

SORBIC ACID

Appearance	White crystalline powder showing no change in colour after heating for 90 minutes at 105 °C.
Melting range	133 – 135 °C, after vacuum drying for four hours in a sulphuric acid desiccator.
Content	Not less than 99 per cent, after vacuum drying for four hours in a sulphuric acid desiccator.
Volatile substances	Not more than 3 per cent determined by drying for 24 hours in a sulphuric acid desiccator.
Sulphated ash	Not more than 0,2 per cent.
Aldehydes	Not more than 0,1 per cent calculated as formaldehyde.

SULPHUR DIOXIDE

Appearance	Colourless gas.
Content	Not less than 99 per cent.
Non-volatile substances	Not more than 0,01 per cent.
Sulphur trioxide	Not more than 0,1 per cent.
Other gases not normally present in the air	No trace.
Selenium	Not more than 10 mg/kg.

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* The specification refers to anhydrous propionic acid; for aqueous solutions calculate values corresponding to their propionic acid content.