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Committee on Food Additives (JECFA), 84th meeting 2017

Metatartaric Acid

(Tentative)

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METATARTARIC ACID (TENTATIVE)

New tentative specifications prepared at the 84th JECFA (2017) and published in FAO JECFA Monographs 20 (2017). The 84th JECFA concluded that metatartaric acid (when used in winemaking) is included in the group ADI of 0–30 mg/kg bw for L(+)-tartaric acid and its sodium, potassium, potassium–sodium salts, expressed as L(+)-tartaric acid.

Information required on:

- *Characterization of the product (optical rotation, content of free tartaric acid, degree of esterification and molecular weight distribution)*
- *IR spectrum (in a suitable medium)*
- *Analysis results including above parameters from a minimum of 5 batches of products currently available in commerce along with QC data.*

The Committee requests that this information be submitted by December 2018.

SYNONYMS

INS No. 353

DEFINITION

Metatartaric acid is a polydisperse polymer of tartaric acid with a degree of esterification above 32%. It is manufactured by heating L-tartaric acid from natural sources at temperatures of 150-170° under atmospheric or under a reduced pressure. The product contains di-tartaric monoester and diester, other polyester acids of variable chain length, as well as non-esterified tartaric acid.

Chemical name

Metatartaric acid

C.A.S. number

56959-20-7/ 39469-81-3

Chemical formula

$(C_4H_4O_5)_n$

Assay

Not less than 105% as total tartaric acid

DESCRIPTION

Crystalline or powder form with an off-white colour. Very deliquescent with a faint odour of caramel

FUNCTIONAL USES Stabilizer (prevents growth and precipitation of potassium bitartrate and calcium tartrate crystals in wine)

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4) Freely soluble in water and soluble in ethanol

pH (Vol. 4) pH of 1% solution = 1.4 - 2.1

Infra-red spectrum
(Vol.4) Information required

Test for tartrate (Vol. 4) Passes test

PURITY

Loss on drying Not more than 5% at 105⁰, 2h

Free tartaric acid Not more than XX % (*Information required*)
See description under METHOD OF ASSAY

Degree of esterification Not less than 32% (See description under METHOD OF ASSAY)

Arsenic (Vol. 4) Not more than 3 mg/kg
Determine using a method appropriate to the specified level. Use Method II to prepare sample solution. The selection of sample size and method of sample preparation may be based on principles of methods described in Volume 4 (under "General Methods, Metallic Impurities").

Lead (Vol. 4) Not more than 2 mg/kg
Determine using a method appropriate to the specified level. The selection of sample size and method of sample preparation may be based on principles of methods described in Volume 4 (under "General Methods, Metallic Impurities").

METHOD OF ASSAY Treating metatartaric acid with sodium hydroxide will cause de-esterification of metatartaric acid resulting in tartaric acid. This will

allow calculation of the degree of esterification. Addition of a known excess of sodium hydroxide solution followed by back titration with standard sulfuric acid to ~ pH=7 (bromothymol blue indicator) will allow calculation of the total free and esterified acid present in the sample.

Reagents:

- Standard sodium hydroxide solution, 1 M
- Standard sulfuric acid solution, 0.5 M
- Bromothymol blue TS

Procedure:

Accurately weigh about 20 g of metatartaric acid (W), dissolve in deionized water and make up to volume in a 1 L volumetric flask, and mix well. Pipette 50 mL of this solution into a Erlenmeyer flask

Add about 10 drops of bromothymol blue TS and mix well.

Titrate with 1 M sodium hydroxide solution until the indicator turns bluish-green (pH=7). Record the titer value, mL (n).

Pipette 20 mL of 1 M sodium hydroxide into the Erlenmeyer flask, stopper and allow to stand for 2 hours at ambient temperature.

Titrate with 0.5 M sulfuric acid until the indicator turns bluish-green (pH=7). Record the titer value, mL (n').

Calculation:

Free tartaric acid: $F (\%w/w) = 150.09 \times n/W$

Esterified tartaric acid: $P (\%w/w) = 150.09 (20-n')/W$

Where:

- W is the weight of sample
- Total tartaric acid, $\%w/w = F+P$
- Degree of Esterification (%) = $100 (20-n')/[n+(20-n')]$

Appendix

Infra-red spectrum of pure metatartaric acid (*Information required*)