



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 1903.54-2021

**National Food Safety Standard - Food Nutrient Fortifier -
Choline Bitartrate**

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Table of Contents

- 1 Scope
- 2 Chemical name, structural formula, molecular
 - 2.1 Chemical name
 - 2.2 Structural formula
 - 2.3 Molecular formula
 - 2.4 Relative molecular mass
- 3 Technical requirements
 - 3.1 Sensory requirements
- Appendix A Inspection methods
- Appendix B). A.2.2 Precipitation reaction

1 Scope

This Standard applies to the food nutrient fortifier choline bitartrate which is obtained through reaction, with trimethylamine, tartaric acid, and ethylene oxide as the main raw materials, concentration (crystallization), separation and drying.

2 Chemical name, structural formula, molecular

formula and relative molecular mass

2.1 Chemical name

(2-Hydroxyethyl) trimethylamine-tartrate

2.3 Molecular formula

C₉H₁₉NO₇

2.4 Relative molecular mass

253.25 (according to the international relative atomic mass in 2018)

3.1 Sensory requirements

Sensory requirements shall be in accordance with Table 1.

Appendix A Inspection methods

A.1 General provisions The reagents and water that are used in this Standard, when no other requirements are specified, refer to analytical reagents and grade-III water which is specified in GB/T 6682. The standard solution, the standard solutions, preparations and products for impurity determination, which are used in the test, are all prepared in accordance with the provisions of GB/T 601, GB/T 602, and

GB/T 603, when no other requirements are specified. The solution used in the test, if not indicated which solvent is used, refers to aqueous solution.

A.2 Identification test **A.2.1 Infrared spectrum test** Use potassium bromide smear method, to measure the infrared absorption spectrum in accordance with GB/T 6040; the measured infrared spectrum shall be consistent with the standard substance spectrum of choline bitartrate (see

Appendix B). A.2.2 Precipitation reaction

A.2.2.1 Reagents and materials Iodine solution: Weigh 14 g of iodine; dissolve it in 100 mL of water that contains

36 g of potassium iodide; add 3 drops of hydrochloric acid; add water to dilute to 1 000 mL; mix well.

A.2.2.2 Analysis steps Weigh 0.5 g of the sample; dissolve it in 2 mL of iodine solution, and it immediately produces a reddish-brown precipitate. After adding 5 mL of 40 g/L sodium hydroxide solution, the precipitate dissolves and the solution becomes clear yellow. Heat the solution, and it produces a light-yellow precipitate.

A.2.3 Color reaction **A.2.3.1 Reagents and materials** **A.2.3.1.1 Potassium ferrocyanide solution:** Weigh 2 g of potassium ferrocyanide $[K_4Fe(CN)_6 \cdot 3H_2O]$; dissolve it in 100 mL of water. This solution is prepared for immediate use.

V1 - the volume of perchloric acid standard solution that is consumed by the titration of the sample solution, in milliliters (mL);

V2 - the volume of perchloric acid standard solution that is consumed by the titration of the blank solution, in milliliters (mL);

M - the molar mass of choline bitartrate, in grams per mole (g/mol), $[M(C_9H_{19}NO_7) = 253.25]$;

1 000 - volume conversion factor;

m - sample mass, in grams (g).

w - the moisture content of the sample, in grams per hundred grams (g/100 g).

The test result is based on the arithmetic mean of the parallel determination results. The absolute difference between two independent determination results that are obtained under

repeatability conditions is not more than 0.5%.

A.4 Determination of ignition residue A.4.1 Reagents and materials Sulfuric acid A.4.2

Instruments and apparatuses A.4.2.1 Balance: sensitivity of 0.1 mg.

A.4.2.2 Crucible.

A.4.2.3 High temperature furnace.

A.4.2.4 Desiccator.

A.4.3 Analysis steps Take about 2 g of the sample (accurate to 0.000 1 g); put it into a crucible that has been ignited to a constant weight; slowly ignite on an electric furnace until it is completely carbonized; cool to room temperature. Add 0.5 mL of sulfuric acid to wet it; heat at low temperature until sulfuric acid vapor completely escapes. Then, move it into a high-temperature furnace and burn it at 800 °C +/- 25 °C until it is completely ashed. Take out the crucible; move it to a desiccator;

let it cool to room temperature; weigh it accurately; then, burn it in a high-temperature furnace until it has a constant weight. Constant weight means that the difference between the two weighings does not exceed 0.5 mg. The carbonization operation is carried out in a fume hood.