



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

GB 1886.71-2015

**National Food Safety Standard -- Food Additives - 1,
2-dichloroethane**

食品安全国家标准 食品添加剂 1, 2-二氯乙烷

(English Translation)

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1 Scope

This standard applies to the reaction of chlorine with ethylene food additive 1,2-dichloroethane.

2.1 Chemical Name

1,2-dichloroethane

2.2 Formula

CCl

Formula 2.3

C₂H₄Cl₂

2.4 Relative molecular mass

98.96 (according to 2007 international relative atomic mass)

3.1 Sensory requirements

Sensory requirements shall comply with the requirements of Table 1.

Table 1 Sensory requirements

Project requires test methods Color colorless Flowable state transparent oily liquid Take appropriate sample is placed in a clean, dry stoppered Erlenmeyer flask, in Natural light, to observe its color and status

3.2 Physical and Chemical Indicators

Physical and chemical indicators should be consistent with the provisions of Table 2.

Table 2. Physical and chemical indicators

Item Index Test Method Refractive index (n_{20D}) 1.444 ~ 1.446 GB/T 614 the relative density (d₂₀₂₀) 1.245 ~ 1.255 GB 5009.2 Boiling range/°C 82 ~ 85 GB/T 615 Water, w /% ≤ 0.03 GB/T 606 Acidity (HCl meter)/(mg/kg) ≤ 10.0 Appendix A A.3 Free halogen test by test A.4 in Appendix A Evaporation residue, w /% ≤ 0.002 GB/T 9740 Lead (Pb)/(mg/kg) ≤ 1.0 GB 5009.12 Appendix A Testing method A.1 General Provisions this standard reagents and water, did not indicate when the other requirements, refer to the three water analytical reagent and GB/T 6682 regulations. test Test used in the standard solution, impurity standard solution, preparations and products, did not indicate when the other requirements, according to GB/T 601, GB/T 602 and GB/T 603 provisions prepared. Solution was used in the tests did not indicate what is formulated with solvent, it refers to an aqueous solution.

A.2 Identification Test A.2.1 solubility A.2.1.1 organic solvent solubility. Take 5mL sample in 100mL with stopper colorimetric tube, either take 1 to 10 times by volume of ethanol, respectively, B the organic solvent is mixed with a sample ether, acetone, shaken for 1min, allowed to stand for 10min, was observed whether delamination. The specimen shall ethanol, ether, acetone Miscible.

A.2.1.2 Water solubility. Take 0.5mL sample in 100mL with stopper colorimetric tube, add water mixing ratio more than 100 times the volume of the sample, Shaking 1min, allowed to stand for 10min, was observed whether delamination. Samples were dissolved in about 120 times the volume of water.

A.2.2 1,2- dichloroethane mass spectrometry A.2.2.1 Method summary Sample directly into the gas chromatograph mass spectrometer after separation of 1,2-dichloroethane in the capillary column gas chromatography mass spectrometer Full scan mode to detect qualitatively.

A.2.2.2 Reagents and materials A.2.2.2.1 1,2- dichloroethane standards. 99% or greater purity.

A.2.2.2.2 hexane. chromatographically pure.

A.2.2.3 instruments and equipment GC - MS.

A.2.2.4 Identification of A.2.2.4.1 reference gas chromatographic conditions Reference gas chromatographic conditions were as follows.

- a) Column. capillary column WAXMS30m x 0.25mm x 0.25μm or equivalent person;
- b) inlet temperature. 230 °C;

- c) Injection mode. split injection, split ratio of 1.50;
- d) Injection volume. 0.2 μ L;
- e) Column temperature. initial temperature 40 °C, to 5 °C/min temperature is increased up to 90 °C, with 40 °C/min temperature is increased up to 250 °C;
- f) Carrier gas. helium, purity not less than 99.999%;
- g) flow rate. 1.0mL/min (constant current).

A.2.2.4.2 reference mass spectrometry conditions Reference MS measurement conditions are as follows.

- a) GC-MS interface temperature. 280 °C;
- b) ion source. electron bombardment ion source, 70eV;
- c) Ion source temperature. 230 °C;
- d) Solvent delay. 2min;
- e) quality scan mode. full scan data;
- f) ion scan range (m/z). 20 ~ 300.

A.2.2.4.3 Determination Injection of standard solution 0.2 μ L in A.2.2.4.1 and A.2.2.4.2 conditions, gas chromatography mass spectrometry. 1,2-dichloroethane Reference retention time 3.690min. Standard product spectrum, Appendix B, Figure B.1.

A.3 Acidity (HCl meter) measurement A.3.1 Reagents and materials A.3.1.1 ethanol.

A.3.1.2 sodium hydroxide standard titration solution, c (NaOH) = 0.01mol/L.

A.3.1.3 phenolphthalein indicator solution. 10g/L.

A.3.2 Instruments and Equipment A.3.2.1 analytical balance. a sense of the amount of 0.0001g.

A.3.2.2 stoppered conical flask. 100mL.

A.3.2.3 single standard pipette. 25mL.

A.3.2.4 Buret. 10mL, minimum scale 0.05mL.

A.3.3 Analysis step

Take ethanol 25mL, 100mL moved with frosted glass stopper mouth Erlenmeyer flask, add 2 drops of phenolphthalein indicator solution. With sodium hydroxide standard drops the first time in a given solution was titrated to a pale pink. Single standard pipette sample 25mL (about 31g), mixed with sodium hydroxide standard titration Titrate to a pale pink appears again, record the volume of sodium hydroxide standard titration solution consumed at this time. Its consumption should not exceed 0.85mL.

A.3.4 Calculation Results Acidity (HCl dollars) w2, in milligrams per kilogram (mg/kg), according to formula (A.1) Calculated.

$c \times V1 \times M$

$\rho \times V$

$\times 1000$ (A.1)

Where.

C --- concentration of sodium hydroxide standard titration solution, expressed in moles per liter (mol/L);

V1 --- consumption volume of sodium hydroxide standard titration solution, in milliliters (mL);

--- The M hydrochloric acid in molar mass in grams per mole (g/mol), M (HCl) = 36.45;

Density ρ --- sample in grams per milliliter (g/mL);

--- The V sample volume in milliliters (mL of);

1000 --- conversion factor.

A.4 free halogen test A.4.1 Reagents and materials A.4.1.1 potassium iodide solution. 10%.

A.4.1.2 starch solution. Take 1g of starch is mixed with red mercuric oxide 0.01g, add enough cold water to make a thin paste. Add boiling water 20mL, stirring constantly boil 1min, cool. Take the supernatant for use.

A.4.2 Analysis step

Take a sample 10mL, 10% potassium iodide solution (A.4.1.1) 10mL and starch solution (A.4.1.2) 1mL mixed after strong shaking 2min, standing layer, the aqueous layer was observed whether the color blue, the same color blue as the water layer by experiment.

Appendix B

1,2-dichloroethane standard gas chromatography mass spectrum 1,2-dichloroethane standard GC-MS is shown in Figure B.1.

Figure B.1 1,2- dichloroethane standard gas chromatography mass spectrum

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