



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

GB 1886.109-2015

**National Food Safety Standard -- Food Additives --
Hydroxypropyl methyl cellulose (HPMC)**

食品安全国家标准 食品添加剂 羟丙基甲基纤维素 (HPMC)

(English Translation)

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1 Scope

This standard applies to food additives, hydroxypropyl methyl cellulose (HPMC).

2 Formula

$R = H \text{ or } CH_3 \text{ or } CH_2CHOHCH_3$

3.1 Sensory requirements

Sensory requirements shall comply with the requirements of Table 1.

Table 1 Sensory requirements

Project requires test methods Color status White to off-white Fibrous powder or granules
Take the right amount of sample is placed in a clean, dry white porcelain dish, Concept
under natural light its color and state police

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 Methoxy (-OCH₃) content, w /% 19.0 ~ 30.0 Appendix A A.4
Hydroxypropoxy (-OCH₂CHOHCH₃) content, w /% 3.0 ~ 12.0 Appendix A A.4 Loss on
drying, w /% ≤ 5.0 GB 5009.3 a direct drying TABLE 2 (cont.) Item Index Test Method
Residue on ignition, w /% Viscosity ≥ 50mPa · s ≤ Viscosity 100mPa · s Claiming 80.0%
to 120.0% of the value Claiming 75.0% ~ 140.0% value Appendix A A.5 Lead (Pb)/(mg/kg)
≤ 3.0 GB 5009.12 a drying temperature of 105 °C ± 2 °C, drying time is 2h.

Appendix A

Testing method

A.1 Safety Tips

Reagents The standard test methods used for toxic or corrosive, according to the relevant provisions of the operation, the operation need to be careful. The pass Fume hood operation steps containing hydroiodic. The use of goggles, acid-resistant gloves and other appropriate safety equipment. Thermal glass processing when extreme care. In case of contact hydroiodic, apply plenty of water and seek medical help immediately.

A.2 General Provisions this standard reagents and water in the absence of other specified requirements, refer to the three water analytical reagent and GB/T 6682 regulations. Test the standard titration solution, impurity measurement standard solution, preparations and products, did not indicate when the other requirements, according to GB/T 601, GB/T 602 and the provisions of GB/T 603 was prepared. Solution was used in the tests did not indicate what is formulated with solvent, it refers to an aqueous solution.

A.3 Identification Test A.3.1 Weigh 1g sample was added 100mL of water, can swell in water to form a transparent milky white viscous colloidal solution.

A.3.2 Weigh 1g sample was added 100mL boiling water, stir (holding part of this sample solution for identification test A.3.3), this sample solution was mushy, cooled to 20 °C, forming a clear or translucent viscous liquid.

A.3.3 A.3.2 Take appropriate amount of sample solution, the sample solution was placed in a glass dish, so that evaporation of water, forming a thin film.

A.4 Determination of methoxy (-OCH₃) and hydroxypropoxy (-OCH₂CHOHCH₃) Content

A.4.1 Reagents and materials A.4.1.1 toluene.

A.4.1.2 o-xylene.

A.4.1.3 adipic acid.

A.4.1.4 hydroiodic acid.

A.4.1.5 isopropyl iodide.

A.4.1.6 methyl iodide.

A.4.2 Instruments and Equipment Gas chromatograph. with a thermal conductivity detector, or other equivalent detectors.

A.4.3 reference chromatographic conditions A.4.3.1 Column. 1.8m x 4mm glass column filler containing 10% of methyl silicone 125μm ~ 150μm chromatography on silica soil Oil, or other equivalent column.

A.4.3.2 Column temperature. 100 °C.

A.4.3.3 Inlet temperature. 200 °C.

A.4.3.4 detector temperature. 200 °C.

A.4.3.5 carrier gas. helium.

A.4.3.6 flow rate. 20mL/min.

A.4.3.7 Injection volume. about 2 μ L.

A.4.3.8 methyl iodide, isopropyl iodide, toluene and o-xylene retention time was 3min, 5min, 7min and 13min.

A.4.4 Analysis step

A.4.4.1 Preparation of internal standard solution Weigh 2.5g toluene, o-xylene diluted to 1000mL with.

A.4.4.2 Preparation of standard solutions Weigh 135mg of adipic acid, placed in an appropriate serum bottle, was added hydroiodic 4.0mL, 4.0mL internal standard solution was added, with a septum Lid sealed bottle, weighing. Injected through a septum 30 μ L isopropyl iodide, and then weighed to calculate the added isopropyl iodide quality. Similarly, through the septum, injection 90 μ L into methyl iodide, reweighed, the calculated mass of methyl iodide was added. Mixed, layered upon standing.

A.4.4.3 Preparation of sample solution Weigh 0.065g sample and put tape presser diaphragm 5mL flask, and sample the same amount of adipic acid was added 2mL internal standard Solution. Carefully draw 2mL hydroiodic, added the bottle, cap tightly, weighing. The bottle was shaken 30s, was heated at 150 °C conditions 20min, then shaken and heated at 150 °C condition 40min. The bottle was cooled 45min, weighing. If the mass loss of more than 10mg, then discarded, re-prepared sample solution.

A.4.4.4 Determination Draw a small part of the standard solution supernatant was under A.4.3 reference chromatographic conditions, the chromatographic analysis, record the chromatograms, mass calculation A Relative response factor F benzene with methyl iodide and other quality of toluene and isopropyl iodide relative response factor F '.

Draw a small part of the upper liquid sample solution in A.4.3 reference chromatographic conditions, the chromatographic analysis, record the chromatograms, calculate the sample A Group (-OCH₃) and hydroxypropoxy content (-OCH₂CHOHCH₃) content.

A.4.5 Calculation Results A.4.5.1 relative response of toluene and methyl iodide and other quality factors F, according to equation (A.1) Calculated.

Where.

Q --- Quality standard solution of toluene and methyl iodide ratio;

A --- chromatogram of the standard solution of methyl iodide with toluene peak area ratio.

The results parallel arithmetic mean of the measurement results shall prevail.

A.4.5.2 relative response of toluene and isopropyl iodide and other quality factors F ', according to equation (A.2) Calculated.

Where.

Q 'Quality --- standard solution in toluene and isopropyl iodide ratio;

A '--- isopropyl standard iodine solution chromatogram peak area ratio with toluene.

The results parallel arithmetic mean of the measurement results shall prevail.

A.4.5.3 sample methoxy (-OCH₃) content w₁, according to equation (A.3) Calculated.

$$w_1 = 2 \times$$

$$142 \times F \times \alpha \times$$

Where.

31/142 --- than the relative molecular mass of methoxy and methyl iodide;

F --- the actual measured in toluene and methyl iodide relative response factor;

[alpha] --- sample solution chromatogram peak area ratio of toluene and methyl iodide;

Mass m₁ --- internal standard solution in toluene, in grams (g);

m₂ --- sample mass, in grams (g).

The results parallel arithmetic mean of the measurement results shall prevail.

A.4.5.4 sample hydroxypropoxy (-OCH₂CHOHCH₃) mass fraction w₂, according to equation (A.4) Calculated.

$$w_2 = 2 \times$$

$$170 \times F' \times \alpha' \times$$

Where.

75/170 --- than the relative molecular mass of hydroxypropoxy and isopropyl iodide;

F '--- the actual measured relative response factor of toluene and isopropyl iodide;

alpha '--- sample solution chromatogram peak area ratio of toluene and isopropyl iodide;

M₃ --- quality of internal standard solution in toluene, in grams (g);

m₄ --- sample mass, in grams (g).

The results parallel arithmetic mean of the measurement results shall prevail.

A.5 Determination of viscosity Weigh the appropriate amount of sample equivalent to 2g dried solid sample, placed in wide mouth 250mL centrifuge bottles, adding 98g 80 °C ~ 90 °C of water. Mechanical stirring 10min, the centrifuge bottle in an ice bath, a uniform temperature of the solution, if necessary, the solution was adjusted to 100g. Centrifugal go in addition to entrained air. The temperature of the sample solution was adjusted to 20 °C ±