

ICS 71.080.70
G 17
Record No.: 59438-2017

HG

Professional Standard of the People's Republic of China

HG/T 5158-2017

Ethyl methyl carbonate for industrial use

工业用碳酸甲乙酯

(English Translation)

Issue date: 2017-07-07

Implementation date: 2018-01-01

**Issued by the Ministry of Industry and Information Technology of the
People's Republic of China**

Contents

Foreword..... i

1 Scope 1

2 Normative references.....1

3 Requirements 2

4 Test methods 2

5 Inspection rules 7

6 Marking, packaging, transportation and storage 7

7 Safety 9

Annex A (Normative) Typical chromatogram for determination of ethyl methyl carbonate content and relative retention value of components.....10

Foreword

Codeofchina.com is in charge of this English translation. In case of any doubt about the English translation, the Chinese original shall be considered authoritative.

This standard is developed in accordance with the rules given in GB/T 1.1-2009.

This standard was proposed by China Petroleum and Chemical Industry Federation.

This standard is under the jurisdiction of Subcommittee on Organic Chemical Industry of National Technical Committee on Chemical of Standardization Administration of China (SAC/TC63/SC2).

Ethyl methyl carbonate for industrial use

Warning: Users of this standard shall be experienced in normal laboratory practicing. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

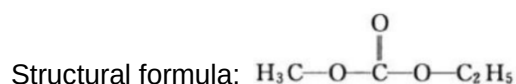
1 Scope

This standard specifies the requirements, test methods, inspection rules, marking, packaging, transportation and storage as well as safety of ethyl methyl carbonate for industrial use.

This standard is applicable to ethyl methyl carbonate for industrial use produced from dimethyl carbonate and ethanol.

The electronic grade and high-purity grade products in this standard are mainly used for lithium battery electrolytes, and the guaranteed grade products are mainly used for industrial organic synthesis and solvents.

Molecular formula: $C_4H_8O_3$



Relative molecular mass: 104.10 (as per the international relative atomic mass in 2011)

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB 190	<i>Packing symbol of dangerous goods</i>
GB 191	<i>Packaging - Pictorial marking for handling of goods</i>
GB/T 601	<i>Chemical reagent - Preparations of standard volumetric solutions</i>
GB/T 602	<i>Chemical reagent - Preparations of standard solutions for impurity</i>
GB/T 603	<i>Chemical reagent - Preparations of reagent solutions for use in test methods</i>
GB/T 605	<i>Chemical reagent - General method for the measurement of colour</i>
GB/T 4472-2011	<i>Determination of density and relative density for chemical products</i>

GB/T 6324.8	Test methods of organic chemical products - Part 8: Determination of water of liquid products - Carl-fischer coulometric method
GB/T 6678	General principles for sampling chemical products
GB/T 6680	General rules for sampling liquid chemical products
GB/T 6682	Water for analytical laboratory use - Specification and test methods
GB/T 8170	Rules of rounding off for numerical values & expression and judgment of limiting values
GB/T 9722	Chemical reagent - General rules for the gas chromatography
GB/T 23942	Chemical reagents - General rules for inductively coupled plasma atomic emission spectrometry
GB 30000.7-2013	Rules for classification and labeling of chemicals - Part 7: Flammable liquids

3 Requirements

3.1 Appearance: Colorless and transparent liquid without visible impurities.

3.2 Technical requirements: Ethyl methyl carbonate for industrial use shall meet the technical indexes shown in Table 1.

Table 1 Technical indexes

Item	Index		
	Electronic grade	High-purity grade	Guaranteed grade
Ethyl methyl carbonate, $\omega/\%$ $\geq$	99.99	99.98	99.95
Methanol content, $\omega/\%$ $\leq$	0.002	0.005	0.01
Ethanol content, $\omega/\%$ $\leq$	0.002	0.005	0.01
Water, $\omega/\%$ $\leq$	0.003	0.01	0.01
Relative density	1.015 $\pm$ 0.005		
Chromaticity (platinum-cobalt) / scale $\leq$	10	10	10
Sodium/($\mu\text{g/mL}$) $\leq$	1.0	—	—
Potassium/($\mu\text{g/mL}$) $\leq$	1.0	—	—
Copper/($\mu\text{g/mL}$) $\leq$	1.0	—	—
Iron/($\mu\text{g/mL}$) $\leq$	1.0	—	—
Lead/($\mu\text{g/mL}$) $\leq$	1.0	—	—
Zinc/($\mu\text{g/mL}$) $\leq$	1.0	—	—
Chromium/($\mu\text{g/mL}$) $\leq$	1.0	—	—
Cadmium/($\mu\text{g/mL}$) $\leq$	1.0	—	—
Nickel/($\mu\text{g/mL}$) $\leq$	1.0	—	—

4 Test methods

4.1 General

Unless otherwise specified, only recognized analytically pure reagents and Class-III water specified in GB/T 6682 are used for the analysis.

Unless otherwise specified, the standard titration solution, the standard solution for determination of impurities, preparations and products used in the analysis are prepared in accordance with GB/T 601, GB/T 602 and GB/T 603.

4.2 Determination of ethyl methyl carbonate, methanol and ethanol content

4.2.1 Method summary

Gas chromatography is adopted. Under the selected chromatographic conditions, the specimen, after vaporized, passes through the chromatographic column so that the components are separated, then detected with a hydrogen flame ionization detector, and the ethyl methyl carbonate, methanol and ethanol content is calculated by area normalization method.

4.2.2 Reagents or materials

4.2.2.1 Hydrogen: with the volume fraction of greater than 99.999%.

4.2.2.2 Nitrogen: with the volume fraction of greater than 99.99%.

4.2.2.3 Air: dried and purified by silica gel or molecular sieve.

4.2.3 Instruments and equipment

4.2.3.1 Gas chromatograph: equipped with hydrogen flame ionization detector (FID) for capillary column analysis. The sensitivity of the whole instrument shall meet the requirements of GB/T 9722, and the linearity range shall meet the analysis requirements.

4.2.3.2 Recorder: Chromatographic work station or processor.

4.2.3.3 Injector: 1 μ L microinjector or automatic injector to improve the reproducibility and detection accuracy of detection results.

4.2.4 Conditions for chromatographic analysis

See Table 2 for the chromatographic columns and chromatographic operation conditions recommended in this standard. Typical chromatogram and relative retention values of the components are shown in Figure A.1 and Table A.1 of Annex A. Other chromatographic columns and chromatographic conditions that can realize the same degree of separation may also be used.