



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

GB/T 24279.1-2018

**Textiles -- Determination of certain flame retardants -- Part 1:
Brominated flame retardants**

Issued on: December 28, 2018

Implemented on: July 1, 2019

Issued by: SAMR; SAC

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3.4 Tetrabromobiphenyl, CAS No. 60044-24-8.

3.5 Pentabromobiphenyl, CAS No. 59080-39-6.

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3.13 Hexabromobiphenyl ether, CAS No. 207122-15-4.

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3.15 Octabromodiphenyl ether, CAS No. 337513-72-1.

3.16 Decabromodiphenyl ether, CAS No. 1163-19-5.

3.17 Hexabromocyclododecane, CAS No. 25637-99-4.

3.18 Decachlorobiphenyl, CASNo. 2051-24-3, internal standard.

3.19 toluene.

4 Instruments and equipment

4.1 Gas chromatography-mass spectrometry (GC-MS).

4.2 Ultrasonic generator. Working frequency 35kHz ~ 45kHz.

4.3 Rotary evaporator, can provide 50 degrees C water bath.

4.4 Brown glass extraction bottle with stopper, 40mL.

4.5 Concentration bottle, 100mL.

4.6 Organic filter, 0.45μm.

4.7 balance, the division value is 0.1mg.

5 Test steps

5.1 Standard solution preparation

1000 µg/mL.

5.2 Sample preparation

5.3 Ultrasonic extraction

5.4 Determination

6 Results calculation

7 Test report

1 Monobromobiphenyl (MonoBB) 152 234,232,152 1

2 Dibromobiphenyl (DiBB) 152 312,310,152 1

3 Tribromobiphenyl (TriBB) 230 392,390,230 1

4 Tetrabromobiphenyl (TetraBB) 310 470,310,308 1

5 Pentabromobiphenyl (PentaBB) 388 550,390,388 1

8 Octabromobiphenyl (OctaBB) 544 785,546,544 5

9 NonaBB 705 864,705,703 5

10 Decabromodiphenyl (DecaBB) 783 944,783,781 10

11 TetraBDE (TetraBDE) 326 488,486,326 1

12 PentaBDE (PentaBDE) 404 564,406,404 1

13 Hexabromodiphenyl ether (HexaBDE) 484 6,484,482 5

14 HeptaBDE 562 722,562,456 5

15 OctaBDE (OctaBDE) 642 801,642,639 5

16 Decabromodiphenyl ether (DecaBDE) 799 959,799,797 10

17 Hexabromocyclododecane (HBCDD) 157 319,239,157 10

18 Decachlorobiphenyl (IS) 498 498,428,214-

1 --- bromobiphenyl;

2 --- dibromobiphenyl;

4 --- tetrabromobiphenyl;

5 --- tetrabromodiphenyl ether;

6 --- pentabromobiphenyl;

7 --- Pentabromobiphenyl ether;

8 --- decachlorobiphenyl (IS);

9 --- hexabromobiphenyl;

10 --- hexabromodiphenyl ether;

11 --- hexabromocyclododecane;

12 --- Heptabromobiphenyl;

13 --- Heptabromodiphenyl ether;

- 14 --- octabromodiphenyl ether;
- 15 --- octabromobiphenyl;
- 16 --- nonabromobiphenyl;
- 17 --- Decabromodiphenyl;
- 18 --- Decabromodiphenyl ether.

Foreword

GB/T 24279 "Determination of certain flame retardants in textiles" is divided into 2 parts.

- Part 1. Brominated flame retardants;
- Part 2. Phosphorous flame retardant.

This part is the first part of GB/T 24279.

This section is drafted in accordance with the rules given in GB/T 1.1-2009.

This section replaces GB/T 24279-2009 "Determination of flame retardants restricted in textiles", compared with GB/T 24279-2009

The technical changes are as follows.

- Modified the standard name;
- Adjusted the type of flame retardant target;
- Removed the chapter on normative references;
- Modified the pre-treatment extraction method;
- The quantitative method was modified from the external standard method to the internal standard method;
- Deleted 3 appendices in the original standard, and added informative appendix A about examples of GC-MS detection parameters.

This section uses the translation method equivalent to ISO 17881-1..2016 "Determination of certain flame retardants in textiles. Part 1. Bromine resistance

Fuel ".

The following editorial changes have been made in this section.

- In order to provide information on storage conditions of standard solutions and easy to use, a note was added in 5.1.3;
- Informative Appendix A, the chromatogram was added for easy operation, and the lower limit of determination of individual measured substances was adjusted.

This section is proposed by China Textile Industry Federation.

This section is under the jurisdiction of the National Technical Committee for Textile Standardization (SAC/TC209).

This section was drafted. China Textile Standards Inspection and Certification Co., Ltd., Jilin Entry-Exit Inspection and Quarantine Bureau, Yantai Zhenghai Hetai Technology Co., Ltd.

Co., Ltd., Fujian Fiber Inspection Bureau, Lilang (China) Co., Ltd., Fujian Fengzhu Textile Technology Co., Ltd., Shanghai Quality Supervision

Inspection Technology Research Institute, Shanghai Tianxiang Quality Technology Service Co., Ltd.

1 Scope

This part of GB/T 24279 specifies the use of gas chromatography-mass spectrometry (GC-MS) to determine certain brominated flame retardants in textiles

Test method.

This section applies to all types of textiles.

2 Principle

The flame retardant in the sample was extracted with toluene through an ultrasonic generator, measured and confirmed by gas chromatography-mass spectrometry, and quantified by internal standard method.

3 reagents

Unless otherwise specified, the reagents used are analytical grade.

3.19 toluene.

Note. Due to the many isomers of brominated flame retardants, this method cannot include all isomers. Flame retardant isomers listed in Chapter 3

The determination can be referred to this method.

5.1.1 Standard and internal standard stock solutions

Toluene (3.19) was used as a solvent to prepare each standard stock solution of each flame retardant (3.1 ~ 3.17) and internal standard (3.18) at a concentration of

1000 µg/mL.

Standard solutions dissolved in other solvents can also be used.