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Textiles - Quantitative chemical analysis - Part 26: Mixtures of melamine and cotton or aramide fibers (method using hot formic acid)

纺织品 定量化学分析 第 26 部分：三聚氰胺纤维与棉或芳纶的混合物（热甲酸法）

(ISO 1833-26:2013, MOD)

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Foreword

GB/T 2910 "Textiles - Quantitative chemical analysis" contains the following parts:

- Part 1: General principles of testing;
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- Part 4: Mixtures of certain protein and certain other fibers (method using hypochlorite);
- Part 5: Mixtures of viscose, cupro or modal and cotton fibers (method using sodium zincate);
- Part 6: Mixtures of viscose or certain types of cupro or modal or lyocell and cotton fibers (method using formic acid and zinc chloride);
- Part 7: Mixtures of polyamide and certain other fibers (method using formic acid);
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- Part 11: Mixtures of cellulose and polyester fibers (method using sulfuric acid);
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- Part 13: Mixtures of certain chloro-fibers and certain other fibers(method using carbon disulfide/acetone);
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- Part 15: Mixtures of jute and certain animal fibers (method by determining nitrogen content);
- Part 16: Mixtures of polypropylene and certain other fibers (method using xylene);
- Part 17: Mixtures of chloro-fibers (homopolymers of vinyl chloride)and certain other fibers(method using sulfuric acid);
- Part 18: Mixtures of silk and wool or hair (method using sulfuric acid);

Textiles - Quantitative chemical analysis - Part 26: Mixtures of melamine and cotton or aramide fibers (method using hot formic acid)

Caution - The substances or methods used in this section may be harmful to human health and the environment if used improperly. This Part only involves technical applicability-related content, at any stage the user is responsible for taking appropriate health and safety and environmental measures.

1 Scope

This Part of GB/T 2910 specifies the method for determining the content of melamine fiber in a bi-component mixture of melamine fiber and cotton or aramid, after removal of non-fibrous matter, by the hot formic acid method.

This Part applies to the mixture of melamine fiber and cotton or aramid.

Note: Appendix A gives the qualitative identification method of melamine fiber. Appendix B gives the quantitative chemical analysis method of the bi-component mixture of melamine fiber and polyester fiber, polyamide fiber or spandex.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 2910.1 Textiles - Quantitative chemical analysis - Part 1: General principles of testing (GB/T 2910.1-2009, ISO 1833-1:2006, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Melamine fiber

Fibers formed from cross-linked macromolecules, which are composed of at least

85% (mass fraction) melamine derivatives.

4 Principles

Use 90% (mass fraction) hot formic acid solution, to dissolve and remove the melamine fiber from the mixture of known dry mass. Collect the residue. Wash, dry and weigh it. Use the corrected mass, to calculate its dry mass percentage of the mixture. The mass percentage of melamine fiber is obtained from the difference.

5 Reagents

5.1 General

Use the reagents, which are specified in GB/T 2910.1 and 5.2 and 5.3 of this Part.

5.2 90% (mass fraction) formic acid solution (density ρ = 1.204 g/mL at 20 °C)

Use water, to dilute 890 mL of 98% ~ 100% (mass fraction) formic acid (density ρ = 1.220 g/mL at 20 °C), to 1 L.

Safety warning: This reagent is harmful to the human body, so perfect protective measures shall be taken when using it.

5.3 Diluted ammonia solution

Use water to dilute 80 mL of ammonia water (density ρ = 0.880 g/mL at 20 °C), to 1 L.

6 Instruments

6.1 General

Use the instruments, which are specified in GB/T2910.1 and 6.2 and 6.3 of this Part.

6.2 Conical flask with stopper

The capacity is not less than 200 mL.

6.3 Oscillating water bath, or other heating equipment

It can perform reciprocating or circular oscillation, at a frequency of 160 times per minute; meanwhile it can maintain the temperature at (90 ± 2) °C.

7 Test steps

Follow the general procedures specified in GB/T 2910.1. Then follow the steps below.

7.1 Put the specimen into the conical flask (6.2).

7.2 Add 100 mL of formic acid solution (5.2) per gram of specimen.

7.3 Cover the flask stopper. Shake the conical flask to wet the specimen.

7.4 Place the flask in an oscillating water bath (6.3), which is maintained at (90 ± 2) °C; shake for 1 h.

Note: The solubility properties of melamine fibers are closely related to temperature.

7.5 Cool the conical flask to room temperature.

7.6 Filter the solution through a filter crucible of known mass.

7.7 Add 50 mL of formic acid solution to the flask, which contains the residue. Shake the flask by hand. Then filter the fibers in the flask through a filter crucible.

7.8 Add a small amount of formic acid solution (5.2), to clean the flask. Transfer the remaining fibers into the filter crucible.

7.9 Use a suction filter device to suction and drain the liquid. Use formic acid solution (5.2) and hot water, to wash the residue. Use dilute ammonia solution (5.3) to neutralize it. Finally use cold water to wash the residue.

7.10 For each cleaning, the liquid shall be drained under gravity first. Then the liquid shall be sucked and drained by a suction filter.

7.11 Finally, dry the crucible and residue; cool and weigh it.

8 Calculation and presentation of results

The calculation and presentation of the results shall be in accordance with the provisions of GB/T 2910.1.

Cotton and aramid have a d-value of 1.02.

9 Precision

For homogeneously blended textile material mixtures, at the 95% confidence level, the confidence limit for this method does not exceed ±2.

Appendix B

(Informative)

Quantitative chemical analysis method of bi-component mixture of melamine fiber and polyester fiber, polyamide fiber or spandex

B.1 Bi-component mixture of melamine fiber and polyester fiber (75% sulfuric acid method)

B.1.1 Principle

Use 75% sulfuric acid solution, to dissolve and remove the melamine fiber from the mixture of known dry mass. Collect the residue. Wash, dry and weigh it. Use the corrected mass, to calculate the percentage of the dry mass of the mixture. The mass percentage of melamine fiber is obtained from the difference.

B.1.2 Reagents

B.1.2.1 Use the reagents, which are specified in GB/T 2910.1 and B.1.2.2 and B.1.2.3 of this Part.

B.1.2.2 75% (mass fraction) sulfuric acid solution: Carefully add 700 mL of concentrated sulfuric acid (density $\rho = 1.84$ g/mL) to 350 mL of water. Cool the solution to room temperature. Then add water to 1 L.

B.1.2.3 Diluted ammonia solution: Use water, to dilute 80 mL of ammonia water (density $\rho = 0.880$ g/mL at 20 °C) to 1 L.

B.1.3 Instruments

B.1.3.1 Use the instruments, which are specified in GB/T 2910.1 and B.1.3.2 and B.1.3.3 of this Part.

B.1.3.2 Conical flask with a stopper, which has a capacity of not less than 200 mL.

B.1.3.3 Oscillating water bath, or other heating equipment, which can keep the temperature at (90 ± 2) °C.

B.1.4 Test procedure

Follow the general procedures, which are specified in GB/T 2910.1. Then follow the steps below.

Put the prepared specimen into the conical flask (B.1.3.2). Add 100 mL of 75% sulfuric acid solution (B.1.2.2) per gram of specimen. Cover the glass stopper. Shake the flask

to wet the specimen. Place it in a constant temperature water bath at (90 ± 2) °C for 1 h. Shake it once every 10 min, to fully dissolve the melamine fiber. Cool the flask to room temperature. Filter the residue into a glass sand core crucible. Drain the liquid by vacuum suction. Add 50 mL of 75% sulfuric acid solution (B.1.2.2) into the crucible, to clean the residue. Drain it under gravity, for at least 1 min, before use vacuum suction. Continuously wash with water for several times. Use dilute ammonia solution (B.1.2.3), to neutralize it twice. Then use cold water to wash it. Drain it under gravity and then by suction for each wash. Finally, dry, cool, weigh the crucible and residue.

B.1.5 Calculation and presentation of results

The calculation and presentation of the results shall be in accordance with the provisions of GB/T 2910.1. The d value of polyester fiber shall be 1.00.

B.2 Bi-component mixture of melamine fiber and polyamide fiber (formic acid method)

The involved principles, reagents, instruments, test procedures, calculation and presentation of results shall be performed, in accordance with GB/T 2910.7. The d value of melamine fiber shall be 1.04.

B.3 Bi-component mixture of melamine fiber and spandex (dimethylformamide method)

The involved principles, reagents, instruments, test procedures, calculation and presentation of results shall be performed, in accordance with GB/T 2910.12. The d value of melamine fiber shall be 1.05.

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