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**Textiles - Quantitative chemical analysis - Mixtures of kapok
with certain other fibers**

纺织品 定量化学分析 木棉与某些其他纤维的混合物

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Table of Contents

Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Two-component mixtures of kapok and certain natural protein fibers (silk, sheep wool, other animal hair fibers) (method using hypochlorite)	5
5 Two-component mixtures of kapok and certain native cellulose fibers (cotton, flax, ramie) (method using formic acid/zinc chloride)	5
6 Two-component mixtures of kapok and certain regenerated cellulose fibers (viscose fiber, modal fiber, lyocell fiber, copper ammonia fiber) (method using sodium hypochlorite)	7
7 Two-component mixtures of kapok and polyester fiber, polypropylene fiber, polyethylene fiber (method using sulfuric acid)	8
8 Two-component mixtures of kapok and polyamide fiber (method using formic acid)	8
9 Two-component mixtures of kapok and polyacrylonitrile fibers, certain modified acrylic fibers or polyurethane elastic fibers (method using dimethylformamide)	8
10 Two-component mixtures of kapok and polyvinyl alcohol fiber (method using hydrochloric acid)	9
11 Mixtures of kapok and acetate fiber or triacetate fiber (method using 75% formic acid)	9
12 Precision	9
13 Test report	9
Appendix A (Informative) Qualitative identification method of kapok	11
References	14

Textiles - Quantitative chemical analysis - Mixtures of kapok with certain other fibers

Warning – The personnel who uses this document shall have hands-on experience in formal laboratory work. As this document does not address all possible safety issues, the user is responsible for taking appropriate safety and health measures and ensuring compliance with the relevant national regulations.

1 Scope

This document describes a method of chemical analysis for the determination of the fiber content of two-component mixtures of kapok with certain other fibers after removal of non-fibrous matter.

This document applies to two-component mixtures of kapok and certain natural protein fibers (silk, sheep wool, other animal hair fibers), certain native cellulose fibers (cotton, flax, ramie), certain regenerated cellulose fibers (viscose fiber, modal fiber, lyocell fiber, copper ammonia fiber), polyester fiber, polypropylene fiber, polyethylene fiber, polyamide fiber, polyacrylonitrile fiber, certain modified acrylic fibers, polyurethane elastic fiber, polyvinyl alcohol fiber, acetate fiber or triacetate.

This document does not apply to mixtures where cotton fibers or regenerated cellulose have been subjected to severe chemical degradation, nor does it apply to mixtures in which there are durable finishing agents or reactive dyes that cannot be completely removed in the kapok, making them insoluble.

Note: See Appendix A for the qualitative identification method of kapok.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the version corresponding to that date is applicable to this document; for undated references, the latest version (including all amendments) is applicable to this document.

GB/T 2910.1, Textiles - Quantitative chemical analysis - Part 1: General principles of testing

GB/T 2910.4, Textiles - Quantitative chemical analysis - Part 4: Mixtures of certain protein and certain other fibers (method using hypochlorite)

5.2.1 Reagents specified in GB/T 2910.1.

5.2.2 Formic acid/zinc chloride solution: Add 20 g of anhydrous zinc chloride (mass fraction >98%) and 68 g of anhydrous formic acid; add water to 100 g.

5.2.3 Dilute ammonia solution: Take 20 mL concentrated ammonia water (density $\rho = 0.880$ g/mL) and use water to dilute it to 1 L.

5.3 Apparatus

5.3.1 Apparatus specified in GB/T 2910.1.

5.3.2 Erlenmeyer flask with stopper: capacity not less than 200 mL.

5.3.3 Constant temperature water bath device: capable of maintaining the temperature at (70 ± 2) °C.

5.4 Test procedures

Follow the general procedures specified in GB/T 2910.1, and then follow the steps below.

Put the prepared sample into an Erlenmeyer flask with stopper (5.3.2) filled with formic acid/zinc chloride solution (5.2.2) which has been preheated to (70 ± 2) °C; add 100 mL of formic acid/zinc chloride solution (5.2.2) to each gram of sample; tightly cap the bottle stopper; shake the flask, to fully wet the sample; then, place it in the constant temperature water bath (5.3.3) at (70 ± 2) °C for 20 min; shake it once after 10 minutes, and shake it again after 20 minutes when taking it out.

Use a glass sand core crucible with known dry weight to filter; use 20 mL of formic acid/zinc chloride solution (5.2.2) at the same temperature and concentration to wash the residue 3 times; then, use water at the same temperature to wash 4 ~ 5 times; then, use cold water to wash, and use dilute ammonia solution (5.2.3) to neutralize; then, use water to wash the residue continuously. After each wash, first drain by gravity, and then drain by vacuum. Finally, dry, cool and weigh.

5.5 Calculations and presentation of results

The calculation and presentation of the results shall be carried out according to the provisions of GB/T 2910.1. The d value of cotton is 1.03, the d value of flax is 1.07, and the d value of ramie is 1.00.

6 Two-component mixtures of kapok and certain regenerated cellulose fibers (viscose fiber, modal fiber, lyocell fiber, copper ammonia fiber) (method using sodium hypochlorite)

6.1 Principle

Use sodium hypochlorite solution to dissolve and remove the kapok from the mixture of known dry mass; collect the residue; wash, dry and weigh; use the corrected mass to calculate the percentage of the dry mass of the mixture. Obtain the second component mass fraction from the difference.

6.2 Reagents

6.2.1 Reagents specified in GB/T 2910.1.

6.2.2 Sodium hypochlorite solution: Add sodium hydroxide (6.2.4) to 1 mol/L sodium hypochlorite solution, making the content 5 g/L. This solution can be titrated by iodometry, making its concentration at 0.9 mol/L ~ 1.1 mol/L.

6.2.3 Dilute acetic acid solution: Add water to dilute 5 mL of glacial acetic acid (distillation range 117 °C ~ 119 °C) to 1 L.

6.2.4 Sodium hydroxide.

6.3 Apparatus

6.3.1 Apparatus specified in GB/T 2910.1.

6.3.2 Erlenmeyer flask with stopper: capacity not less than 200 mL.

6.3.3 Constant temperature water bath device: capable of maintaining the temperature at (60 ± 2) °C.

6.4 Test steps

Follow the general procedures specified in GB/T 2910.1, and then follow the steps below.

Put the prepared sample into the Erlenmeyer flask with stopper (6.3.2); add 100 mL sodium hypochlorite solution (6.2.2) to each gram of sample; plug the glass stopper; shake the flask, to fully wet the sample; place it in the constant temperature water bath (6.3.3) at (60 ± 2) °C for 45 min; shake once every 15 min, and take it out after 45 min and shake again.

10 Two-component mixtures of kapok and polyvinyl alcohol fiber (method using hydrochloric acid)

The involved principle, reagents, apparatus, test procedure, calculation and presentation of results shall be carried out according to the method using hydrochloric acid in FZ/T 01132-2016, and the d value of kapok is 1.01.

11 Mixtures of kapok and acetate fiber or triacetate fiber (method using 75% formic acid)

The involved principle, reagents, apparatus, test procedure, calculation and presentation of results shall be carried out in accordance with 10.1 of GB/T 38015-2019, and the d value of kapok is 1.01.

12 Precision

For a homogeneous mixture of textile materials, at the 95% confidence level, the confidence limits of the test results of the method using formic acid/zinc chloride do not exceed $\pm 2\%$, and the confidence limits of the test results of other methods do not exceed $\pm 1\%$.

13 Test report

The test report shall include the following.

- a) method in this document adopted.
- b) the measured results of all components or a single component of the mixture.
- d) details of the special pretreatment used to remove sizing agent or finishing agent, if adopted;
- d) each single value and its average value, accurate to 0.1%.
- e) notes that the above results are based on:
 - 1) net dry mass percentage;
 - 2) percentage combined with the conventional moisture regain;
 - 3) percentage including the conventional moisture regain and the fiber loss in pretreatment;

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