FZ

TEXTILE INDUSTRY STANDARD OF

THE PEOPLE'S REPUBLIC OF CHINA

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Textiles - Quantitative chemical analysis - Multinary fiber mixtures

纺织品 定量化学分析

多组分纤维混合物

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Table of Contents

Textiles - Quantitative chemical analysis - Multinary fiber mixtures

1 Scope

This standard specifies the quantitative chemical analysis method for textiles of multinary fiber mixtures.

This standard applies to textiles of quaternary and above fiber mixtures.

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) are applicable to this standard.

GB/T 2910 (All parts) Textiles - Quantitative chemical analysis

GB/T 8170 Rules of rounding off for numerical values & expression and judgement of limiting values

GB 9994 Conventional moisture regains of textiles

3 Principle

For the qualitatively identified multinary fiber mixture textiles, use appropriate pretreatment methods to remove non-fibrous materials, determine the appropriate dissolution scheme, select the specified chemical reagents, dissolve one or several component fibers in the mixture, calculate the mass percentage of each component fiber from the mass loss after dissolution or the mass of the residual fiber.

4 Reagents and equipment

Use the equipment and reagents as specified in the relevant parts of GB/T 2910.

P_2 - The net dry mass percentage of the 2nd component, %;

P_3 - The net dry mass percentage of the 3rd component, %;

P_4 - The net dry mass percentage of the 4th component (insoluble component), %;

r_1 - The dry weight of the residue after the first component is dissolved and removed by the 1st reagent, in grams (g);

r_2 - The dry weight of the residue after the first and second components are dissolved and removed by the 1st and 2nd reagent, in grams (g);

r_3 - The dry weight of the residue after the first, second and third components are dissolved and removed by the 1st, 2nd and 3rd reagent, in grams (g);

$d_{2,1}$ - The mass loss correction factor of the second component in the first reagent;

$d_{3,1}$ - The mass loss correction factor of the third component in the first reagent;

$d_{3,2}$ - The mass loss correction factor of the third component in the second reagent;

$d_{4,1}$ - The mass loss correction factor of the fourth component in the first reagent;

$d_{4,2}$ - The mass loss correction factor of the fourth component in the second reagent;

$d_{4,3}$ - The mass loss correction factor of the fourth component in the third reagent;

m - The net dry mass of the specimen (after pretreatment), in grams (g).

A.1.2 Application examples

A.1.2.1 Overview

After qualitative analysis, the fabric is known to be composed of four kinds of fibers: wool, nylon, viscose and cotton. The continuous dissolution scheme is used to continuously remove the three components, and the results are as follows:

1) The dry weight of the specimen after pretreatment, m = 1.1854 g;

2) The dry weight of the specimen (nylon + viscose + cotton) after the first treatment by 1 mol/L alkaline sodium hypochlorite in accordance with the

P_{3A} (viscose) = 29.89%, P_{4A} (cotton) = 35.00%.

The composition of the blended fabric is as follows:

Wool 4.4%, nylon 30.7%;

Viscose 29.9%, cotton 35.0%.

A.2 Scheme 2 (other dissolution schemes)

A.2.1 Overview

After qualitative analysis, the fabric is known to be composed of four kinds of fibers: wool, mulberry silk, acrylic fiber and cotton. Two samples are taken, the dissolution scheme is as follows:

a) The first sample

- After the pretreatment, the dry weight of the specimen is m_1 = 1.4284 g;
- In accordance with the method of GB/T 2910.18, use the 75% sulfuric acid to dissolve the (mulberry silk + acrylic + cotton), the remaining (wool) dry weight: $r_{(wool)}$ = 0.3721 g.

b) The second sample

- After the pretreatment, the dry weight m_2 = 1.4200 g;
- In accordance with the method of GB/T 2910.4, use the 1 mol/L alkaline sodium hypochlorite to dissolve the (wool + silk), the remaining (acrylic + cotton) dry weight: $r_{(acrylic + cotton)}$ = 0.6555 g;
- In accordance with the method of GB/T 2910.12, use the dimethylformamide to dissolve the acrylic fiber, and the remaining (cotton) dry weight: $r_{(cotton)}$ = 0.3561 g.

A.2.2 Net dry mass percentage

A.2.2.1 For the first specimen, consider the quaternary mixture as a two-component sample (n = 2), the first component (mulberry + acrylic + cotton), and the second component (wool), to calculate the net dry mass percentage of fiber, then it can get the following results:

P_2 (wool) = (0.3721 × 0.985) / 1.4284 × 100 = 25.66%

P_1 (mulberry silk + acrylic + cotton) = 100 - 25.66 = 74.34%

A.2.2.2 For the second sample, consider the quaternary mixture as a three-component sample (n = 3), the first component (wool + mulberry silk), the

reagent;

$d_{4,1}$ - The mass loss correction factor of the fourth component in the first reagent;

$d_{4,2}$ - The mass loss correction factor of the fourth component in the second reagent;

$d_{4,3}$ - The mass loss correction factor of the fourth component in the third reagent;

$d_{5,1}$ - The mass loss correction factor of the fifth component in the first reagent;

$d_{5,2}$ - The mass loss correction factor of the fifth component in the second reagent;

$d_{5,3}$ - The mass loss correction factor of the fifth component in the third reagent;

$d_{5,4}$ - The mass loss correction factor of the fifth component in the fourth reagent;

m - The dry mass of the specimen (after pretreatment), in grams (g).

B.2 Application examples

B.2.1 Overview

After qualitative analysis, the fabric is known to be composed of five kinds of fibers: wool, nylon, acrylic, viscose and polyester. The continuous dissolution scheme is used to continuously remove the 4-component, and the results are as follows:

1) After the sample is pretreated, the dry weight is m = 1.2421 g;

2) The dry weight after first treatment of the specimen in accordance with the method of GB/T 2910.4 by 1 mol/L alkaline sodium hypochlorite (nylon + acrylic + viscose + polyester): r_1 = 0.6046 g;

3) The dry weight of the residues above residue (acrylic fiber + viscose fiber + polyester) after the second treatment of the above residue r_1 in accordance with the method of GB/T 2910.7 by formic acid: r_2 = 0.4936 g;

4) The dry weight of the residues above residue (viscose fiber + polyester) after the third treatment of the above residue r_2 in accordance with the method of GB/T 2910.12 by dimethylformamide: r_3 = 0.4033 g;

5) The dry weight of the residues above residue (polyester) after the fourth

$d_{2,1}$ - The mass loss correction factor of the second component in the first reagent;

$d_{3,1}$ - The mass loss correction factor of the third component in the first reagent;

$d_{3,2}$ - The mass loss correction factor of the third component in the second reagent;

$d_{4,1}$ - The mass loss correction factor of the fourth component in the first reagent;

$d_{4,2}$ - The mass loss correction factor of the fourth component in the second reagent;

$d_{4,3}$ - The mass loss correction factor of the fourth component in the third reagent;

$d_{5,1}$ - The mass loss correction factor of the fifth component in the first reagent;

$d_{5,2}$ - The mass loss correction factor of the fifth component in the second reagent;

$d_{5,3}$ - The mass loss correction factor of the fifth component in the third reagent;

$d_{5,4}$ - The mass loss correction factor of the fifth component in the fourth reagent;

$d_{6,1}$ - The mass loss correction factor of the sixth component in the first reagent;

$d_{6,2}$ - The mass loss correction factor of the sixth component in the second reagent;

$d_{6,3}$ - The mass loss correction factor of the sixth component in the third reagent;

$d_{6,4}$ - The mass loss correction factor of the sixth component in the fourth reagent;

$d_{6,5}$ - The mass loss correction factor of the sixth component in the fifth reagent;

m - The net dry mass of the specimen (after pretreatment), in grams (g).

C.2 Application examples