



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

GB/T 41418-2022

**Textiles - Quantitative chemical analysis - Mixtures of
meta-aramid and para-aramid fibres (method using
dimethylacetamide and lithium chloride)**

纺织品 定量化学分析 间位芳香族聚酰胺纤维与对位芳香族聚酰胺纤维的混合物
(氯化锂/N,N-二甲基乙酰胺法)

Issued on: April 15, 2022

Implemented on: November 1, 2022

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	4
4 Principle	4
5 Reagents	5
6 Instruments and equipment	5
7 Test procedures	5
8 Calculation and expression of results	6
9 Precision	6
10 Test report	6
Appendix A (Informative) Identification method of meta-aramid and para-aramid fibres	7
References	11

Foreword

This document was issued on 15 April 2022 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 November 2022.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 41418-2022 covers the quantitative separation of meta-aramid from para-aramid in a two-fibre blend, once non-fibrous matter has been removed, using a lithium chloride and dimethylacetamide solution that dissolves the meta-aramid and leaves the para-aramid behind as a weighable residue. The principle sets out that sequence - dissolve, collect the residue, wash, dry, weigh, and calculate the percentage against the known dry mass of the mixture. The reagents clause opens with a warning that the lithium chloride/dimethylacetamide solution is harmful and that the work belongs in a fume hood with full protective measures. The instruments clause builds on the general apparatus of GB/T 2910.1 and adds a stoppered conical flask of not less than 300 mL and a reflux condenser; the test procedure and the calculation of results likewise follow GB/T 2910.1, with the mass change correction coefficient d for the para-aramid fibre fixed at 1.00 - the

agreed figure without which two laboratories weighing the same residue would still report different fibre contents. Precision is given as a confidence limit not exceeding plus or minus 1 percent at the 95 percent level, and an informative appendix gives a way to identify the two aramids before quantifying them. Textile testing houses, and the buyers verifying blend declarations on protective clothing, are the audience.

This document describes the determination of fibre content in bicomponent mixtures of meta-aramid and para-aramid fibres after removal of non-fibrous materials by the method using lithium chloride and dimethylacetamide.

This document applies to bicomponent mixtures of meta-aramid and para-aramid fibres.

Note: See Appendix A for the identification method of fibres in the mixture of meta-aramid and para-aramid fibres.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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

3 Terms and definitions

No terms and definitions need to be defined in this document.

4 Principle

Use lithium chloride/dimethylacetamide solution to dissolve and remove the meta-aramid fibres 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 percentage content of meta-aramid fibres from the difference.

5 Reagents

Warning: Lithium chloride/dimethylacetamide solution is harmful to human body, therefore, thorough protection measures shall be taken when using it, the test shall

be carried out in a fume hood, and attention shall be paid to avoid dripping reagents on the heating device during use.

5.1 Use the reagents specified in GB/T 2910.1.

5.2 Lithium chloride/dimethylacetamide solution: Take 2.0 g of anhydrous lithium chloride (mass fraction >98%); add 104 mL of dimethylacetamide solution (density at 0.940 g/mL ~ 0.944 g/mL at 20 °C); heat and stir to completely dissolve the lithium chloride.

Note: This reagent needs to be prepared and used immediately; the boiling point is about 166 °C.

6 Instruments and equipment

6.1 Use the instruments and equipment specified in GB/T 2910.1.

6.2 Conical flask with stopper: capacity not less than 300 mL.

6.3 Reflux condenser: used for condensation of lithium chloride/dimethylacetamide solution, connected to a conical flask.

6.4 Heating device: such as universal electric furnace (with asbestos mesh).

7 Test procedures

7.1 Carry out in accordance with the sample preparation methods and general procedures specified in GB/T 2910.1.

7.2 Put the prepared sample into the conical flask (6.2); add 200 mL of lithium chloride/dimethylacetamide solution (5.2) to every gram of sample; connect the reflux condenser (6.3); use the heating device (6.4) to boil for 20 min (keep boiling during the period); filter the residue to a known dry weight and preheat the glass sand core crucible in an oven above 60 °C for at least 10 min; vacuum draw and drain.

7.3 Transfer the residue to the original conical flask; add 100 mL of lithium chloride/dimethylacetamide solution (preheated in a constant temperature water bath above 80 °C); use a glass rod to stir for not less than 1 min; filter it into the original glass sand core crucible; drain the liquid under the action of gravity and then vacuum to drain; repeat the operation once.

7.4 Use boiling water to wash twice in a row (it is regarded as once for filling the sand core crucible); then, use laboratory room temperature water to wash. For each washing, drain the liquid first by gravity and then by vacuum suction; dry the crucible and residue, cool and weigh.

8 Calculation and expression of results

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

The mass change correction coefficient d of the para-aramid fibre is 1.00.

9 Precision

For a homogeneous mixture of textile materials, at the 95% confidence level, the confidence limit of the test results of this document shall not exceed $\pm 1\%$.

10 Test report

The test report shall include the following:

- a) method of this document adopted;
- b) sample description;
- c) test results of all components of the mixture;
- d) details of the special pretreatment to remove slurry or finishing agent, if adopted;
- e) Note 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 fibre loss in pretreatment;
 - 4) percentage including the conventional moisture regain and the non-fibrous material removal.

.....