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

GB/T 38405.2-2025

**Leather and fur - Determination of chlorinated hydrocarbons -
Part 2: Middle-chain chlorinated paraffins(MCCPs)**

皮革和毛皮 氯代烃的测定 第2部分：中链氯化石蜡

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting is required.

This document is Part 2 of GB/T 38405. GB/T 38405 has been published in the following parts.

-- Chemical tests for leather and fur - Determination of short-chain chlorinated paraffins (GB/T 38405-2019);

This document is modified to adopt ISO 18219-2:2021 "Determination of chlorinated hydrocarbons in leather and leather - Part 2: Chromatographic determination of medium-chain chlorinated hydrocarbons Mineral MCCPs.

Compared with ISO 18219-2:2021, this document has more structural adjustments. The structural number changes between the two documents are shown in the following table.

See Appendix A for the table.

This document has many technical differences compared to ISO 18219-2:2021.

A single line (I) is used to indicate these technical differences. A summary of these technical differences and their reasons is given in Appendix B.

The following editorial changes were made to this document.

- Changed the standard name;
- Added the first-level heading of "Sampling and specimen preparation";
- Changed the expression method of chromatographic column specifications;

--Added explanations for some letter codes in the formula.

Introduction

Chlorinated paraffins are chlorinated derivatives of paraffin hydrocarbons, a complex mixture of thousands of chlorinated alkanes isomers and diastereomers.

The chlorine content varies between 30% and 70%. It has the advantages of low volatility, flame retardancy, good electrical insulation, and low price. It can be used as a flame retardant and Polyvinyl chloride auxiliary plasticizer, widely used in the production of leather, textiles, cables, hoses, rubber and other products.

Waxes are divided into short-chain chlorinated paraffins (SCCPs) (C10-C13), medium-chain chlorinated paraffins (MCCPs) (C14-C17) and long-chain chlorinated paraffins (LCCPs).

(C18~C38). SCCPs are mainly used as leather treatment agents in the leather industry, while MCCPs are mainly used as fatliquor in the leather industry.

LCCPs are generally not used in the leather industry. While chlorinated paraffins are used in large quantities, their hazards are also gradually being recognized.

Studies have shown that chlorinated paraffins are persistent, bioaccumulative and toxic and have been listed as a member of the Persistent Organic Pollutants the Stockholm Convention on the Prevention and Control of Pollution from Pollutants (POPs) added a class of compounds to the list of persistent organic pollutants, and relevant limit requirements were also introduced at home and abroad.

GB/T 38405 aims to provide a basis for the determination of chlorinated hydrocarbons in leather and fur and is intended to consist of two parts.

--Part 1: Short-chain chlorinated paraffins (SCCPs). The purpose is to establish the method for determining the content of SCCPs (C10~C13) in leather and fur.

Test method.

--Part 2: Medium-chain chlorinated paraffins (MCCPs). The purpose is to establish the determination of MCCPs (C14~C17) content in leather and fur.

test method.

Medium-chain chlorinated paraffins (MCCPs) are a class of complex compounds with carbon chain lengths of 14 to 17, mainly used in leather fatliquor, flame retardant Studies have shown that MCCPs have PBT (persistent, bioaccumulative, toxic) and/or vPvB (very persistent, very bioaccumulative) characteristics.

It has a strong toxicity and will have a serious impact on human health and the ecological environment. It has been proposed by the European Chemicals Agency to be included in

Annex II of the RoHS Directive.

Since the location of chlorine atoms and the chlorination ratio in chlorinated paraffins vary greatly, the quality of SCCPs and MCCPs is There is overlap, which makes short-chain chlorinated paraffins interfere with the analysis of medium-chain chlorinated paraffins, making it difficult to separate, identify and measure MCCPs.

Therefore, the determination methods for SCCPs and MCCPs in leather are different and not universal.

In 2021, ISO 18219-2:2021 "Determination of chlorinated hydrocarbons in leather - Part 2: Chromatographic method" was officially released.

The "Methods and Methods for the Determination of MCCPs in Leather" provides a basis for the determination of MCCPs in leather, but there is no relevant method standard in my country, and it is urgent to develop one.

to meet industry needs.

This document is Part 2 of GB/T 38405. When GB/T 38405-2019 is revised, it is intended to be Part 1 of GB/T 38405.

And change the name of the standard to "Determination of Chlorinated Hydrocarbons in Leather and Fur Part 1: Short-chain Chlorinated Paraffins".

Determination of chlorinated hydrocarbons in leather and fur Part 2: Medium-chain chlorinated paraffins

1 Scope

This document describes a test method for the determination of C14-C17 medium-chain chlorinated paraffins (MCCPs) in leather and fur.

This document is applicable to the determination of MCCPs content in various types of leather, fur and their products.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

GB/T 39364 Sampling locations for chemical, physical, mechanical and colour fastness tests on leather (GB/T 39364-2020, ISO 2418.

2017, MOD)

QB/T 1267 Sampling areas for chemical, physical, mechanical and colour fastness tests on fur QB/T 1272 Preparation of fur chemical test samples QB/T 2716 Preparation of leather chemical test samples

3 Terms and definitions

There are no terms or definitions that require definition in this document.

4 Principle

The sample was extracted with n-hexane ultrasonically under specified conditions. The extract was purified by sulfuric acid and then analyzed by gas chromatography-electron capture ionization.

The samples were analyzed by GC-ECN-MS.

If the user can demonstrate that liquid chromatography-mass spectrometry (LC-MS) or liquid chromatography-tandem mass spectrometry (LC-MS/MS) is comparable to GC-MS this method may also be used when GC-ECNI-MS has equivalent test results, see Appendix C. In the event of a dispute or arbitration, GC-ECNI-MS the test results shall prevail.

In some cases, the presence of sulfonated chlorinated paraffins and equivalent chain length chlorinated olefins can be detected when MCCPs are determined by GC-ECNI-MS.

Appendix C provides LC-MS/MS, which aims to provide higher resolution and eliminate GC-ECN I-MS

Possible false positives during testing.

5 Reagents and Materials

5.1

Unless otherwise specified, all reagents used were of analytical grade.

5.2

n-Hexane, CAS No.. 110-54-3.

5.3

Internal standard (IS) solution. dissolve gamma-hexachlorocyclohexane (commonly known as "lindane", CAS No.. 58-89-9) in n-hexane (5.2) and prepare a mass standard solution.

The concentration of the solution is 1 000 µg/mL.