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

YC/T 207-2014

**Determination of solvent residuals on papers for cigarette -
Headspace-gas chromatography/mass spectrometry
(English Translation)**

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Table of Contents

Foreword...	3
1 Scope...	4
2 Principle...	4
3 Reagents and materials...	4
4 Instruments and conditions...	6
5 Specimen preparation...	8
6 Analysis steps...	9
7 Calculation and expression of results...	10
8 Repeatability, recovery, detection limit...	11
9 Test report...	11
Appendix A (Informative) Examples of typical residual solvent quantification ions.	13
Appendix B (Informative) Chromatogram example...	14

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009 and GB/T 20001.4-2001.

This standard replaces YC/T 207-2006 "Determination of volatile organic compounds in cigarette carton and packet packaging papers - Headspace-gas chromatography".

Compared with YC/T 207-2006, the main technical changes of this standard are as follows.

- CHANGE the name of the standard to "Determination of solvent residuals on papers for cigarette - Headspace-gas chromatography/mass spectrometry";
- ADJUST the scope of application, to add cigarette paper such as cigarette tipping paper and cigarette lining paper;
- MODIFY the instrument detection method and detection indicators.

Please note that some contents of this document may involve patents. The issuing agency of this document does not assume the responsibility for identifying these patents.

This standard was proposed by the State Tobacco Monopoly Administration.

This standard shall be under the jurisdiction of the Tobacco Materials Sub-Technical Committee of the National Tobacco Standardization Technical Committee (SAC/TC 144/SC 8).

The drafting organizations of this standard. Shanghai Tobacco Group Co., Ltd., Zhengzhou Tobacco Research Institute, China Tobacco Standardization Research Center, National Tobacco Quality Supervision and Inspection Center, Guangdong China Tobacco Industry Co., Ltd., Yunnan Tobacco Science Research Institute, Hongyun Honghe Tobacco (Group) Co., Ltd., Fujian China Tobacco Industry Co., Ltd., Hunan China Tobacco Industry Co., Ltd., Hongta Tobacco (Group) Co., Ltd., Henan China Tobacco Industry Co., Ltd., Jiangxi China Tobacco Industry Co., Ltd., Yunnan China Tobacco Industry Co., Ltd.

1 Scope

This standard specifies the headspace-gas chromatography/mass spectrometry determination method for solvent residues (benzene, toluene, ethylbenzene, xylene, styrene, methanol, ethanol, isopropanol, n-propanol, n-butanol, acetone, 4-methyl-2-pentanone, butanone, cyclohexanone, ethyl acetate, n-propyl acetate, n-butyl acetate, isopropyl acetate, 2-ethoxyethyl acetate, 1-methoxy-2-propanol, 1-ethoxy-2-propanol, 2-ethoxyethanol, dimethyl succinate, dimethyl glutarate, dimethyl adipate) in cigarette paper; other solvent residues can make reference to this standard.

This standard is applicable to cigarette rod packaging paper, box packaging paper, cigarette tipping paper, cigarette lining paper; other cigarette papers can make reference to this standard.

2 Principle

In a closed container and at a certain temperature, when the solvent residue in the specimen reaches equilibrium between the gas phase and the matrix (liquid phase or solid phase), the gas phase is introduced into the gas chromatograph/mass spectrometer for separation and identification. After matrix correction, the solvent residue in the specimen is determined.

3 Reagents and materials

Warning - Relevant volatile organic compounds shall not be placed in the laboratory. Experimenters shall wear protective equipment to ensure safety. Test waste liquid shall be collected and disposed of uniformly.

Unless otherwise required, reagents of analytical grade or above shall be used.

3.2.1.11 Acetone.

3.2.1.12 4-Methyl-2-pentanone.

3.2.1.18 Isopropyl acetate.

3.2.1.19 2-Ethoxyethyl acetate.

3.2.1.20 1-Methoxy-2-propanol.

3.2.2 Other solvent residue standard samples

Determined by the qualitative analysis results of cigarette paper specimens.

3.3.1 Mixed standard stock solution

According to the qualitative analysis results of the solvent residue in the test specimen, weigh the corresponding solvent residue standard samples (3.2) respectively; dissolve them in triacetin (3.1), to prepare a mixed standard stock solution.

3.3.2 Standard working solutions

The series of standard working solutions shall use triacetin (3.1) as solvent, using mixed standard stock solutions to dilute and prepare series of standard working solutions. The series of standard working solutions shall be prepared in at least 5 levels; the appropriate concentration shall be prepared according to the actual content of the sample. Place it at room temperature when taking it; use it only after it reaches room temperature.

5.1 General requirements

Take laboratory samples for specimen preparation. For flat sheets of cigarette paper, samples shall be taken from the middle or from the 4th or 5th layer to prepare the specimen; for rolls and disks of cigarette paper, at least 3 layers of the surface shall be

discarded before sampling and preparing the specimen. Prepare two parallel specimens for each sample.

5.2 Hard box packaging paper

Take a piece of hard box packaging paper sample; cut a specimen with an area of 22.0 cm x 5.5 cm; the specimen shall include the main packaging surface. Roll the cut specimen into a tube with the printed surface facing inward; immediately put it into a headspace bottle; add 1000 μ L of triacetin (3.1); seal it for testing.

5.4 Strip packaging paper

Take a strip packaging paper sample; cut a specimen with an area of 22.0 cm x 5.5 cm in the central area of the front of the packaging paper; roll the specimen into a tube with the printed surface facing inward; immediately put it into a headspace bottle; add 1000 μ L of triacetin (3.1); seal it and wait for testing.

5.5 Cigarette tipping paper

Take a tipping paper sample; cut a specimen with an area of 20.0 cm x 4.0 cm. The specimen shall contain a single edge. Roll the cut specimen into a tube with the printed side facing inwards. Immediately put it into a headspace bottle. Add 1000 μ L of triacetin (3.1). Seal it and wait for testing.

5.6 Cigarette lining paper

Take a lining paper sample; cut a specimen with an area of 17.0 cm x 10.0 cm. Roll the cut specimen into a tube with the printed side facing inwards. Immediately put it into a headspace bottle. Add 1000 μ L of triacetin (3.1). Seal it and wait for testing.

6.1.1 Qualitative identification of typical solvent residues

Use the corresponding cigarette paper base (box packaging paper base, strip packaging paper base, cigarette tipping paper base, cigarette lining paper base, baked at 80 °C for

6.1.2 Qualitative identification of other solvent residues

First, the ion fragments of the chromatographic peak in the total ion flow of the mass