

ICS 71.100.60  
CCS Y 41



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

**GB/T 11539-2008**

---

**Fragrance/Flavor substances -- Analysis by gas  
chromatography on packed columns -- General method  
(English Translation)**

**Issued on: July 15, 2008**

**Implemented on: December 1, 2008**

---

**Issued by: General Administration of Quality Supervision, Inspection and  
Quarantine of the PRC**

## Table of Contents

|                                         |    |
|-----------------------------------------|----|
| Foreword...                             | 3  |
| Introduction...                         | 4  |
| 1 Scope...                              | 5  |
| 2 Normative references...               | 5  |
| 3 Principle...                          | 5  |
| 4 Reagents and products...              | 6  |
| 5 Apparatus...                          | 7  |
| 6 Preparation of test sample...         | 8  |
| 7 Operating conditions...               | 8  |
| 8 Column performance...                 | 8  |
| 9 Determination of retention indexes... | 13 |
| 10 Methods of determination...          | 15 |
| 11 Expression of results...             | 17 |
| 12 Test report...                       | 19 |

### Foreword

This Standard is identical to ISO 7359:1985 "Essential oil - Analysis by gas chromatography on packed columns - General method". Compared with ISO 7359:1985, this Standard mainly changes the "essential oil" in the standard name and the standard to "fragrance/flavor substances".

This Standard is the combination and revision of GB/T 11539-1989 "Isolate and synthetic aromatics - Analysis by gas chromatography on packed columns - General method" and GB/T 14455.9-1993 "Essential oils - Analysis by gas chromatography on packed columns - General method".

This Standard was proposed by China National Light Industry Council.

This Standard shall be under the jurisdiction of National Standardization Technical Committee on Flavor Fragrance & Cosmetic.

This Standard was drafted by Shanghai Research Institute of Fragrance &

Flavor Industry.

Main drafters of this Standard: Jin Qizhang, Xu Yi, Cao Yi.

The previous editions of the standard replaced by this Standard were released as follows:

- GB/T 11539-1989;
- GB/T 14455.9-1993.

Fragrance/Flavor substances -

Analysis by gas chromatography on packed columns -

General method

## 1 Scope

This Standard specifies a general method for the analysis of fragrance/flavor substances by gas chromatography on packed columns for the purpose of determining the content of a specific constituent and/or searching for a characteristic profile.

## 2 Normative references

The following documents contain provisions which, through reference in this Standard, constitute provisions of this Standard. For the dated references, their subsequent amendments (excluding corrections) or revisions do not apply to this Standard. However, the parties who enter into agreement based on this Standard are encouraged to investigate whether the latest editions of these documents are applicable. For undated reference documents, the latest editions apply to this Standard.

GB/T 11538 Essential oil - Analysis by gas chromatography on capillary columns - General method (GB/T 11538-2006, ISO 7609:1985, IDT)

GB/T 14454.1 Fragrance/Flavor substances - Preparation of test samples (GB/T 14454.1-2008, ISO 356:1996, MOD)

### 3 Principle

Analysis by gas chromatography under specified conditions of a small quantity of fragrance/flavor substance on a column packed with appropriate material. If required, identification of the different constituents from their retention indexes. Quantitative determination of specific constituents by measurement of peak areas.

### 9 Determination of retention indexes

If it is necessary to determine the retention indexes, prepare a mixture of the test portion with normal alkanes including n-pentane. Choose the normal alkanes in accordance with the range of retention indexes expected. After stabilization of the temperature of the column, inject a suitable quantity of the mixture and proceed with the analysis under the conditions specified in 10.1. Chromatogram "B" is thus obtained.

#### 9.1 Measurement of retention indexes

Compare chromatograms "A" (see 10.1) and "B" (see clause 9) and note on chromatogram "B" the peaks corresponding to the normal alkanes.

On chromatogram "B", make the following measurements.

##### 9.1.1.1 If a detector with thermal conductivity is used, calculate the difference

between the retention distances of the top of the peak under consideration and the top of the air peak. Let be this difference, in millimetres.

Calculate the difference between the retention distances of the top of the air peak and the top of the normal alkane peak appearing immediately before the peak considered. Let be this difference, in millimetres.

Calculate the difference between the retention distances of the top of the air peak and the top of the normal alkane peak appearing immediately after the peak considered. Let be this difference, in millimetres.

**9.1.1.2 If a flame ionization detector is used, calculate the difference between**

the retention distances of the top of the peak considered and the top of the methane peak. Let be this difference, in millimetres.

Calculate the difference between the retention distances of the top of the methane peak and the top of the normal alkane peak appearing immediately before the peak considered. Let be this difference, in millimetres.

Calculate the difference between the retention distances of the top of the methane peak and the top of the normal alkane peak appearing immediately after the peak considered. Let be this difference, in millimetres.

**9.1.2 Procedure using linear temperature programming from injection**

Measure the distance on the base line between the top of the peak the retention

.....