

ICS 75.080
CCS E 30

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

SN/T 5262-2020

**Determination of each aromatic hydrocarbon content and total
aromatic hydrocarbon content in imported mixed aromatic
hydrocarbons-two-dimensional gas chromatography**

进口混合芳烃中各芳烃含量和总芳烃含量的测定 二维气相色谱法

(English Translation)

Issued on: August 27, 2020

Implemented on: March 1, 2021

Issued by: General Administration of Customs

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Foreword

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

This standard was proposed and managed by the General Administration of Customs of the People's Republic of China.

The main drafting organizations of this standard. Shenzhen Customs of the People's Republic of China and Zhanjiang Customs of the People's Republic of China.

1 Scope

This standard stipulates the determination of benzene, toluene, ethylbenzene, xylene, C₉ and above aromatic hydrocarbons in imported mixed aromatic hydrocarbons by two-dimensional gas chromatography.

Method of total aromatics content.

The concentration ranges of each aromatic hydrocarbon determined by this standard are. benzene, 0.1% (mass fraction) ~ 5% (mass fraction); toluene, 0.1% (mass fraction) Mass fraction) ~ 50% (mass fraction); single C₈ component, 0.1% (mass fraction) ~ 20% (mass fraction); C₉ and above aromatic hydrocarbons, 1% (mass fraction) to 30% (mass fraction);

total aromatics, 10% (mass fraction) to 100% (mass fraction).

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article. For undated reference documents, the latest version (including all amendments) is applicable to this document.

SH/T 0604 crude oil and petroleum products density determination method (U-shaped vibrating tube method)

3 Terms and definitions

The following definitions and terms apply to this document.

Mixed aromatics

A mixture of aromatic hydrocarbons, the main components of which are toluene, ethylbenzene, xylene, C9 and above aromatic hydrocarbons, a small amount of benzene, alkenes and alkanes and other non-aromatic components.

4 Method summary

After adding an appropriate amount of internal standard to the sample, it is introduced into a two-dimensional capillary gas chromatograph equipped with a valve switching system, and it is measured separately after two analyses.

Determine the content of benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, C9 and above aromatics. In the first analysis, the sample flows first. After the polar pre-column, non-aromatic hydrocarbons of C9 and below will flow out and vent from the polar pre-column first, and switch the valve state to make the polar pre-column place before benzene flows out.

In the backflushing state, the retained components are introduced into the non-polar analytical column, and benzene, toluene and internal standard substances flow out of the non-polar column in the order of boiling point.

Into the detector (FID), when the internal standard flows out, reset the valve so that the remaining components in the analytical column are blown back out of the chromatographic column into the detector (FID);

The second analysis is carried out in the same steps as the first analysis, except that the non-aromatic hydrocarbons smaller than C12, benzene and toluene are all pre-polarized.

After the column flows out, vent, switch the valve state before the ethylbenzene flows out to make the polar pre-column in a backflush state, and introduce the retained components into

the non-polar Analytical column, internal standard substance and C8 aromatic hydrocarbons flow out of non-polar column and enter the detector (FID) in order of boiling point. When o-xylene flows out, the valve is turned off.

Reset makes the remaining C9 and above aromatics in the analytical column blow back out of the chromatographic column into the detector (FID). Qualitatively based on retention time, based on the peak area was quantified by the internal standard method.

5 Reagents

5.1 2-hexanone. internal standard substance with a purity greater than 99.5%.

5.2

Isooctane. The purity is greater than 99.5%.

5.3

Benzene. The purity is greater than 99.9%.

5.4

Toluene. The purity is greater than 99.9%.

5.5

Ethylbenzene. The purity is greater than 99.9%.

5.6

Ortho-Xylene. The purity is greater than 99.9%.

5.7

Para-xylene. purity greater than 99.9%.

5.8

m-xylene. purity greater than 99.9%.

5.9

m/p-xylene mixture. p-xylene (5.7) and m-xylene (5.8) are mixed according to the mass ratio of 1.1, Represents m-xylene and p-xylene.

5.10 1,2,4-Trimethylbenzene. The purity is greater than 99.9%.

5.11

Helium. The purity is greater than 99.95%.

5.12

Nitrogen. The purity is greater than 99.95%.

6.1.1 Capillary gas chromatograph

Equipped with a valve switching system, which can operate under the conditions in Table 1, with the column switching and backflushing system shown in Figure A.1 in Appendix A.

6.1.2 Detector

Flame ionization detector (FID).

6.1.3 Switching valve

Located in a temperature-controllable area, it can realize the switching function shown in Figure A.1 in Appendix A. The dead volume should be small, it is recommended to use a 10-port valve with an outer diameter of 1.6 mm. It is recommended to use an automatic valve switching device to ensure the repeatability of the switching time.

6.2.1 Polarity pre-column

TCEP micro-packed column, a stainless steel tube with a length of 560 mm x an outer diameter of 1.6 mm x an inner diameter of 0.38 mm, filled with 0.14 g ~ 0.15 g TCEP/Chromosorb P (AW) stationary phase with a mass fraction of 20%, the particle size of Chromosorb P (AW) is 0.177 mm ~ 0.149 mm (80 mesh ~ 100 mesh), or other polar columns with equivalent column efficiency.

6.2.2 Non-polar analytical column

WCOT methyl silicone column, 30 m x 0.53 mm x 0.5 mm, or equivalent.

6.3 Analytical balance

Sensitivity 0.1 mg.

6.4 Glass vials

With stopper, 10 mL.

7.1 Preparation of standard solution

7.1.1

Use isooctane (5.2) pre-cooled to below 10 °C as a solvent to prepare standard solutions of each component (5.3 to 5.10). Using the weighing method, Prepare standard solutions with the following concentrations (mass fraction) of various components. benzene, 0.1%, 0.5%, 1%, 2%, 5%; toluene, 0.1%, 1%, 5%, 10%, 20%, 50%; ethylbenzene, o-xylene, m/p-xylene, 0.1%, 0.5%, 1%, 5%, 10%, 20%; 1,2,4-trimethylbenzene, 1%, 5%, 10%, 20%, 30%.