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

SN/T 5261-2020

**Determination of aromatic compounds in hydrocarbons-gas
chromatography**

烃中芳烃化合物的测定 气相色谱法

(English Translation)

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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.

Drafting organizations of this standard. Nanjing Customs of the People's Republic of China, Shenzhen Customs of the People's Republic of China, Qingdao of the People's Republic of China customs.

1 Scope

This standard specifies the determination of C6 ~ C10 aromatic compounds in hydrocarbons by gas chromatography, and the minimum quantification limit of each aromatic compound is 0.01% (M/m).

This standard applies to petroleum fractions or aromatic hydrocarbon mixtures whose final boiling point is lower than 210 °C.

2 Method summary

The sample is injected into a gas chromatograph equipped with a flame ionization detector (FID) and a polyethylene glycol fused silica capillary column.

The C6 ~ C10 aromatic compounds in the sample were quantified by normalizing the area.

3 Reagents and materials

Unless otherwise specified, only use reagents that have been confirmed to be analytically pure or above.

3.1

Hydrogen. the purity is not less than 99.95%.

3.2

Nitrogen. the purity is not less than 99.99%.

3.3

Benzene. the purity is not less than 99.9%, and the CAS number is 71-43-2.

3.4

Toluene. the purity is not less than 99.8%, and the CAS number is 108-88-3.

3.5

Xylene. The purity is not less than 98.5%, and the CAS number is 1330-20-7.

3.6 1-Methyl-2-ethylbenzene. The purity is not less than 99%, and the CAS number is 611-14-3.

3.7 1,2,3,4-Tetramethylbenzene. purity not less than 99%, CAS number 488-23-3.

3.8

n-heptane. purity not less than 99%, CAS number 142-82-5.

3.9

Preparation of calibration standard samples. prepare calibration standard samples according to the volatility of reagents and the principle of accurate weighing and mixing in the order from low to high.

A typical calibration standard sample contains 25% (mass concentration) n-heptane, 15% (mass concentration) benzene, 20% (mass concentration) toluene, 20% (mass concentration) Quantity concentration) mixed xylene, 10% (mass concentration) 1-methyl-2-ethylbenzene and 10% (mass concentration) 1,2,3,4-tetramethylbenzene. school the composition of the quasi-standard sample is based on the sample to be analyzed. If the sample to be analyzed has similar components but different concentrations, prepare each of the calibration standards.

The concentration of the substance is as close as possible to the component concentration of the sample to be analyzed. In order to reduce the volatilization of light components, cool all used to prepare calibration standards Chemical reagents. When not analyzing, store the

calibration standard in a sealed container at 0 °C ~ 5 °C.

4 Instruments

4.1

Analytical balance. Sensitivity 0.1 mg.

4.2

Gas chromatograph. programmable temperature rise, with split inlet, equipped with hydrogen flame ionization detector (FID). Under operating conditions, the signal-to-noise ratio of 0.01% (mass concentration) benzene should not be less than 5. It is recommended to use an electronic pressure control system (EPC).

4.3

Data acquisition system. Calculate peak area and retention time by computer or electronic integrator.

4.4

Chromatographic column. cross-linked polyethylene glycol silica capillary column, the column length is 60 m, the inner diameter is 0.32 mm, and the film thickness is 0.5 μm. Able to achieve the same score Other columns with separation effects can also be used.

4.5

Sampler. A syringe or sampler that can accurately introduce 0.5 μL of liquid sample into the gas chromatograph. It is recommended to use an autosampler.

5.1 Gas chromatographic conditions

Prepare the instrument in accordance with the chromatographic operating conditions in Appendix A. As long as the typical chromatogram (see Appendix B) and the required sensitivity can be obtained and the separation effect, other chromatographic operating conditions can also be used.

5.2 Determination of relative correction factor

5.2.1

Inject 0.5 μL of calibration standards into the chromatograph, and identify the chromatographic peaks of each component in the chromatogram (see Appendix B).

The peak area is the average of three repeated test results.

5.2.2

Using n-heptane as the benchmark, calculate the relative correction factor of each component according to formula (1), and keep three significant figures.

5.2.3

The determined relative correction factor should conform to the following sequence. F
benzene<F toluene<F mixed

xylene<F1-methyl-2-ethylbenzene<F1,2,3,4-tetramethylbenzene<F positive Heptane, and the relative deviation between the measured relative correction factor and the theoretical relative correction factor (see Appendix C) should not exceed 5%. Otherwise, check again the preparation process of the chromatograph and calibration standards.

Note: When establishing or changing the chromatographic operating conditions for the first time, determine the relative correction factors of each component according to 5.2.1 to 5.2.3. Periodically measure calibration standards for verification Instrument performance.

6 Sample analysis

6.1

Introduce the sample into the chromatograph according to the same technique and injection volume used for the analysis of the calibration standard sample.

6.2

Compare the chromatogram obtained by sample analysis with a typical chromatogram (see Appendix B) to qualitatively identify the components. when necessary, it is further characterized by comparison of the retention time of pure substances, gas chromatography-mass spectrometry or other techniques.

6.3

All unqualified components before n-butylbenzene are non-aromatics, and all qualitative components with 8 carbon atoms are C8 aromatics.

The qualitative component with 9 atoms is C9 aromatics, all the qualitative components with 10 carbon atoms are C10 aromatics, all after n-butylbenzene Unidentified components are C11 aromatic hydrocarbons.

7 Result calculation

7.1

The content of each component or group After qualitatively identifying each component or group, measure the peak area of each component or group, and calculate the peak area of each component or group according to formula (2) content.

7.2 Total aromatics content

The total aromatics content is derived from the addition of the contents of benzene, toluene, C8 aromatics, C9 aromatics, C10 aromatics and C11 aromatics, and keep the three