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

GB/T 17144-2021

**Petroleum products - Determination of carbon residue - Micro
method**

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Foreword

This document is in accordance with GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document replaces GB/T 17144-1997 "Petroleum products carbon residue determination method (micro method)", compared with GB/T 17144-1997, except

In addition to structural adjustments and editorial changes, the main technical changes are as follows.

a) Added introduction;

b) The standard name has been changed, from the original name "Determination of Carbon Residue in Petroleum Products (Micro Method)" to "Determination of Residual Carbon in Petroleum Products"

Micro method";

c) Changed the scope (see Chapter 1, Chapter 1 of the.1997 edition);

d) Two notes added to the term "carbon residue" (see 3.1);

e) The meaning and purpose are deleted (see Chapter 4 of the.1997 edition);

f) The method summary has been changed (see Chapter 4, Chapter 5 of the.1997 edition);

g) The regulations on the material of the sample tube, the requirements for the use of the 4mL sample tube and the description of the sample tube of other materials have been changed

(See 6.1, 7.1 of the.1997 edition);

h) The annotations of the components in Figure 1 and Figure 2 have been changed (see 6.3, 6.4, 7.3, 7.4 in the.1997 edition);

i) Modified sample preparation (see Chapter 7, Chapter 8 of the.1997 edition);

j) The weighing of samples is included in the test procedure chapter, the sample sampling requirements in Table 1 are revised, and the recommended samples are added to Table 1.

The content of quality control (see Chapter 8, Chapter 9 and Chapter 10 of the.1997 edition);

k) The calculation has been changed, and the expression of the relationship between this method and the measured value of the Kang's carbon residue method has been added (see Chapter 9,.1997 Edition Chapter 11

chapter);

l) Change "report" to "representation of results" and delete the requirement to use the arithmetic mean of the results of two repeated determinations as the report value (see Chapter 10, Chapter 13 of the.1997 edition);

m) Added the reproducibility limit and reproducibility limit of the 10% (volume fraction) distillation residue carbon residue of the middle distillate using a 4mL sample tube.

(See Chapter 11, Chapter 12 of the.1997 edition);

n) Change "10% (volume fraction) distillation residue" to "10% (volume fraction) distillation residue" (see Chapter 7, Chapter 7,.1997 edition)

Chapter 8), amend "green coke box" and "coking box" to "coking oven" (see 6.3,.1997 edition of 7.3);

o) Added test report (see Chapter 12).

This document uses the redrafting method to amend and adopt ISO 10370.2014 "Determination of the Trace Method for Carbon Residue in Petroleum Products".

Compared with ISO 10370.2014, this document has made the following structural adjustments.

---Move the two notes and the fourth paragraph of the ISO 10370.2014 scope under the term 3.1, and move the second paragraph into the introduction,

In order to meet the compilation requirements of our country's standards;

---Incorporate the sample transfer in ISO 10370.2014 into the test procedure to comply with industry writing habits;

---The ISO 10370.2014 reference [4] and the reference to this document have been deleted.

The main technical differences between this document and ISO 10370.2014 and the reasons are as follows.

---For ease of use, replace the cited international documents with the corresponding Chinese documents;

---The content of Note 1 of 6.1 in ISO 10370.2014 has been revised to comply with my country's writing rules;

---Added index number 7 to Figure 2 of 6.4 in ISO 10370.2014 to indicate the reference position of the sample tube to facilitate understanding;

---Modified the description of the step of preparing the 10% (volume fraction) distillation residue of the middle distillate in 7.3.2 of ISO 10370.2014.

Easy to use;

---Revised Table 1 of 8.3 in ISO 10370.2014 to avoid the confusion of sample size and the use of sample tubes.

Introduction

The measurement results obtained by the micro method in this document and the measurement results obtained by the Kang's method are statistically significant within the range of 0.10% to 25.0% (mass fraction).

There is no significant difference in meaning, see Appendix A for details.

Determination of residual carbon in petroleum products by micro method

Warning---Personnel using this document should have practical experience in formal laboratory work. The use of this document may involve certain dangerous

This document does not point out all possible safety issues. The user is responsible for taking appropriate safety and health measures

And ensure compliance with the conditions stipulated by relevant national laws and regulations.

1 Scope

This document describes the method for the determination of residual carbon in petroleum products by the micro method.

This document is applicable to petroleum products, and the range of the mass fraction of residual carbon is 0.10%~30.0%. This document can also be used to determine

Petroleum products with carbon mass fraction less than 0.10%, but the precision has not been determined.

2 Normative references

The content of the following documents constitutes an indispensable clause of this document through normative references in the text. Among them, dated quotations

Only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

This document.

GB/T 6536 Determination of atmospheric distillation characteristics of petroleum products

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Carbon residue

Under the oxygen (air) conditions specified in this document, the sample is the residue formed after evaporation and high-temperature pyrolysis.

Note 1. Carbon residue can be used to estimate the tendency of petroleum products to form carbonaceous sediments under similar degradation conditions, and can be used to evaluate the phase of similar petroleum products.

Opposite the coke trend. Therefore, it is advisable to understand the results from the above aspects.

Note 2. Ash content (see GB/T 508) and non-volatile additives in the sample will also be included as part of the total carbon residue report value. In some distillate fuels,

The presence of organic nitrates may cause abnormally high carbon residues. The content of alkyl nitrate in fuel can be measured using SH/T 0559.

4 Method summary

Put the weighed sample into a sample tube and heat it to

500°C. During the heating process, volatile substances are discharged with nitrogen, and the residual carbonaceous residue is weighed to obtain the carbon residue value.

5 materials

Nitrogen. The purity is above 98.5% (volume fraction), and it is output at a pressure of