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SH/T 0770-2005

Standard test method for freezing point of aviation fuels

(Automatic phase transition method)

航空燃料冰点测定法

(自动相转换法)

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Foreword

This Standard modifies and adopts American Society for Testing and Materials Standard ASTM D 5979-02 *Standard Test Method of Aviation Fuel Freezing Point (Automatic Phase Transition Method)*.

This Standard is redrafted according to ASTM D 5979-02.

In order to adapt to the situations of our country, this Standard is amended when it uses ASTM D 5979-02. The main differences between this Standard and ASTM D 5979-02 are as follows:

- The references of this Standard use the corresponding national standards of China.

For convenient use, this Standard also made the following editorial amendments:

- The representation of repeatability and reproducibility text was amended according to the practice of China.
- Delete the key words in Chapter 13.

Annex A in this Standard is the normative.

This Standard was proposed by China Petroleum and Chemical Corporation.

This Standard shall be under jurisdiction of Research Institute of Petroleum and Chemical of China Petroleum and Chemical Corporation.

Drafting organization of this Standard: Research Institute of Petroleum and Chemical of China Petroleum and Chemical Corporation.

Main drafters of this Standard: Zhang Qian, and Gong Dongmei.

Standard Test Method of Aviation Fuel Freezing Point (Automatic Phase Transition Method)

1 Scope

1.1 This Standard specifies the determination method of freezing point of jet fuel; the jet fuel less than this temperature will form the solid hydrocarbon crystalline.

1.2 This Standard is applied to determine the range of freezing point of $-80^{\circ}\text{C} \sim +20^{\circ}\text{C}$, however, the research among laboratories mentioned in Article 12.4 only verifies the range of freezing point of jet fuel of $-45^{\circ}\text{C} \sim -65^{\circ}\text{C}$.

1.3 When this standard is used to determine JetB and JP4 specimen, the user shall note that (see Article 12.3).

Note: JetB and JP4 are equivalent to the wide distillation jet fuel specified in GJB 2375 of China.

1.4 This Standard uses SI (international unit system) as the standard measurement unit.

1.5 In the use of this Standard, it may involve in the hazardous materials, operation and equipment. This Standard does not propose the suggestions on all safety problems related to this; the user has the responsibility to establish the corresponding safety and protection measures before it uses this Standard, and identify its limited applicable scope.

2 Normative references

The articles contained in the following documents have become part of this document when they are quoted herein. For the dated documents so quoted, all subsequent modifications (excluding corrigendum) or revisions made thereafter do not apply to this Standard. However, the parties who reach an agreement according to this Standard are encouraged to study whether the latest versions of these documents may be used. For the undated documents so quoted, the latest versions (including all modification sheets) apply to this document.

GB/T 2430 Jet fuels - Determination of freezing-point

GJB 2376 Specification for wide distillation jet fuels

ASTM D2386 Standard Test Method of Aviation Fuel Freezing Point

3 Terms and definitions

The following terms and definitions are applied to this Standard.

Warning: use the wooden cotton swab will cause the damage to the mirror surface of sample cup.

8 Preparation of instrument

8.1 Install the instrument according to the operation instructions of manufacturer.

8.2 Open the liquid cooling media circulation system according to the operation instructions of manufacturer to ensure that the temperature of cooling media is suitable to the test requirements of specimen (refer to Article 7.2 note).

8.3 Open the gas purge system according to the instructions of manufacturer to ensure adjusting to the proper pressure.

Note: Some instruments may have a gas source for generating the drying and purging the gas; in this case, it is not required to be equipped with the compression gas equipment.

8.4 Open the switch of master power supply of this analysis instrument.

9 Calibration and standardization

9.1 It shall ensure that the instrument is calibrated, inspected and operating according to the instructions of manufacturer.

9.2 Use a specimen of jet fuel, which has been determined by the method in GB/T 2430 and has a lot of freezing data, to verify the performance of this instrument. Take multiple specimens which have been verified in laboratory as the inspection standard; the specimens of these standards may be obtained from the mutually verified specimens in laboratory. The n-octane or n-nonane with analytically pure of the known freezing value may be used to verify the temperature measurement device in the instrument.

10 Test steps

10.1 Open the cover of detection chamber, and use the cotton swab to clean the sample cup in detection chamber.

10.2 Use the sample injector to take $0.15\text{mL} \pm 0.01\text{mL}$ of specimen to inject into the sample cup for cleaning; use the cotton swab to wipe the sample cup; the sample cup shall be wiped until there is no obvious residual sample drop.

10.3 Clean the sample cup according to the steps of 10.2 again.

10.4 Take $0.15\text{mL} \pm 0.01\text{mL}$ of specimen accurately; inject it into the sample cup.

10.5 Cover and lock the cover of detection chamber.

is no same-deviation in all samples; all differences are within the reproducibility range (2.5°C) of ASTM D2386 (i.e. GB/T2430); two kinds of fuel are exceptional; these two samples are the samples of JP4 and JetB; and they are 2.5°C and 2.8°C higher than the average result of test method ASTM D2386 (GB/T2430) respectively. Therefore, when using this Standard to determine JP4 and JetB sample, the user shall note that.

12.4 The precision is also obtained from the laboratory cooperation test plan in 1994. The 14 sample groups for analysis include various aviation fuels with the freezing point range of -45°C ~ +65°C; 9 laboratories participated in the test USE the automatic phase transition device; 15 laboratories participated in the test USE manual ASTM D2386 (i.e. GB/T 2430) method to determine. The statistics of precision is complied and calculated according to 0.1°C resolution provided by the automatic phase transition method.