GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

ICS 71.040.01
N 53

GB/T 21186-2007

Fourier transform infrared spectrometer

傅立叶变换红外光谱仪

Issued on: September 12, 2007 **Implemented on: May 01, 2008**

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

Standardization Administration of the PRC.

Table of Contents

Fourier transform infrared spectrometer

1 Scope

This Standard specifies the requirements, test methods, inspection rules, marking, packaging, transportation, storage, quality assurance, etc. of Fourier transform infrared spectrometer.

This Standard applies to the Fourier transform infrared spectrometer of the measuring band in the mid-infrared region (hereinafter known as “instrument” for short).

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 191-2000 Packaging - Pictorial marking for handling of goods (eqv ISO 780:1997)

GB/T 2829-2002 Sampling procedures and tables for periodic inspection by attributes (Apply to inspection of process stability)

GB/T 15464-1995 General-purpose specification for the packaging of instrumentation products

JB/T 9329-1999 Basic environmental conditions and testing methods for instruments transportation and storage in the transportation

3 Requirements

3.1 Normal working conditions of instrument

a) The temperature is 15°C~30°C. The relative humidity shall be less than 70%;

b) The instrument shall be placed on a stable workbench. There shall be no

better than 0.5 cm^{-1} (including 0.5 cm^{-1}), shall be less than 1/2 of the set resolution; for instruments with a resolution below 0.5 cm^{-1}, shall not exceed ±1 cm^{-1}.

3.8 Wave-number repeatability

The instrument's wave-number repeatability, for instruments with a resolution better than 0.5 cm^{-1} (including 0.5 cm^{-1}), shall be less than 1/2 of the set resolution; for instruments with a resolution below 0.5 cm^{-1}, shall not exceed ±1 cm^{-1}.

3.9 Safety requirements

3.9.1 Insulation resistance

Under normal working conditions, the insulation resistance of the instrument shall be no less than 20 MΩ.

3.9.2 Dielectric strength

Under normal working conditions, the instrument shall be able to withstand a voltage test of 1500 V AC rms for 1 min without arcing and breakdown.

3.9.3 Leakage current

Under normal working conditions, the leakage current of the instrument shall be no more than 5 mA.

3.10 Instrument appearance

a) There shall be no peeling on all plating surfaces of the instrument;

b) The spray paint or powder coating surface shall be uniform in color. There shall be no obvious bruise, appearance of grounding, cracks, and blistering;

c) The joints of exposed parts shall be neat. There shall be no roughness and unevenness;

d) The text, symbols, and marking on the panel shall be straight and clear.

3.11 Instrument completeness

It shall be in accordance with the specific instrument standards.

3.12 Transportation, storage in the transportation

The instrument, in the state of transportation packaging, shall be tested

Same as 4.2 setting. The air background spectrum and the air sample spectrum are collected. Obtain the 100%τ line. The RMS values of transmittances of wave-number segments of 1000 cm^{-1}~900 cm^{-1}, 2200 cm^{-1}~2100 cm^{-1} (or 2100 cm^{-1}~2000 cm^{-1}), and 4100 cm^{-1}~4000 cm^{-1} are calculated.

4.5 Transmittance repeatability

Same as 4.2 setting. COLLECT the air background spectrum. PUT in a 0.05 mm polystyrene thin film standard sample; COLLECT the sample spectrum, to obtain a transmittance spectrum of the sample. The measurement is repeated 6 times in succession. The transmittances of two bands of 906 cm^{-1} and 1942 cm^{-1} are respectively measured. The maximum τ_{max} and the minimum τ_{min} of the transmittances are taken. The repeatability is τ_{max}-τ_{min}.

4.6 Resolution

4.6.1 SET the highest resolution of the instrument. The scanning speed is placed at the optimal position. The number of scans is 32. The apodization function is BOXCOR. The instrument diaphragm is at the minimum. For instruments with a resolution better than 0.5 cm^{-1} (including 0.5 cm^{-1}), a gas cell filled with carbon monoxide is used to measure. COLLECT the background spectrum. PUT in the gas cell filled with carbon monoxide gas (The gas pressure of carbon monoxide for measuring the resolution is shown in Table 3), to collect the sample's transmittance spectrum. USE the definition of the full width at half maximum of the peak. The full width at half maximum of the 2193.36 cm^{-1} spectral line of carbon monoxide gas is measured.

Table 3 -- Scope of application of carbon monoxide gas pressure

Resolution /cm^{-1}	Pressure /kPa
0.5	4.0
0.125	1.2

4.6.2 Same as 4.6.1 setting. For instruments with a resolution lower than 0.5 cm^{-1}, USE the water peak in the air to measure; COLLECT the background spectrum, to obtain a background spectral energy diagram. USE the definition of the full width at half maximum of the peak. The full width at half maximum of the symmetrical water peak spectral line in the selected range of 1900 cm^{-1}~1700 cm^{-1} is calculated.

4.7 Wave-number accuracy

4.7.1 For instruments with a resolution better than 0.5 cm^{-1} (including 0.5 cm^{-1}), SET the highest resolution of the instrument. The scanning speed is placed at the optimal position. The number of scans is 32. The apodization function is BOXCOR. The instrument diaphragm is at the minimum. COLLECT the

4.9.1 Insulation resistance

The power plug of the instrument is not connected to the grid. The power switch is placed in the on position. USE an insulation resistance meter to apply a 500 V DC test voltage between the phase-to-center connection of power plug and and the ground wire. After 5 s of stabilization, the insulation resistance is measured.

4.9.2 Dielectric strength

The power plug of the instrument is not connected to the grid. The power switch is placed in the on position. PUT the output current of withstand voltage tester at 5 mA. Apply a test voltage between the phase-to-center connection of power plug and and the ground wire. The test voltage shall, within 5 s~10 s, gradually rise from zero to 1500 V, and keep it for 1 min; then within 5 s~10 s, steadily drop to zero.

4.9.3 Leakage current

PLACE the instrument on an insulated workbench. Its power plug is connected to the output end of leakage current meter. The leakage current meter is connected to the grid and powered. The instrument's power switch is placed in the on position. The voltage is adjusted to 242 V. MEASURE once. The current value is recorded. CHANGE the polarity of the power supply; REPEAT the measurement once; RECORD the current value. Take the maximum of the two values.

4.10 Instrument appearance

Visual and hand touch inspection.

4.11 Instrument completeness

Visual inspection.

4.12 Transportation, storage in the transportation

It shall be carried out according to the methods of 4.1~4.5 in JB/T 9329-1999.

5 Inspection rules

5.1 Inspection classification

The inspection of the instrument is classified into exit-factory inspection and type inspection.

inspection, as a qualified product, can leave the factory or be put in storage. If the storage is more than 12 months before leaving the factory, the exit-factory inspection shall be carried out again.

6 Marking, packaging, transportation, and storage

6.1 Marking

6.1.1 Instrument marking

a) Manufacturer name;

b) Instrument model;

c) Instrument name;

d) Trademark;

e) Manufacture date exit-factory number;

f) License marking and number for manufacturing measuring instruments.

6.1.2 Packaging marking

a) Name and address of manufacturer;

b) Instrument model;

c) Instrument name;

d) Trademark;

e) License marking and number for manufacturing measuring instruments;

f) Instrument mass; the unit is kg. The volume is length×width×height; the unit is mm×mm×mm;

g) Packaging - Pictorial marking for handling of goods: “Fragile items”, “upward”, “avoid rain”, etc. shall comply with the provisions of GB/T 191-2000;

h) The name and address of delivery, receipt organizations.

6.2 Packaging

6.2.1 The packaging of the instrument shall comply with the provisions of moisture-proof and shock-proof packaging in GB/T 15464-1995.

This is an excerpt of the PDF (Some pages are marked off intentionally)

------ The End ------