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Replacing GB/T 23799-2009

Methanol gasoline (M85) for motor vehicles

车用甲醇汽油(M85)

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Methanol gasoline (M85) for motor vehicles

WARNING -- If proper precautions are not followed, the products covered by this Standard may be dangerous during production, storage, transportation and use. This Standard is not intended to advise on all safety issues related to this product. It is the user's responsibility to establish appropriate safety and health measures before using this Standard. Determine the applicability of relevant regulatory restrictions.

1 Scope

This Standard specifies the requirements and test methods, inspection rules, marking, packaging, transportation and storage of methanol gasoline (M85) for motor vehicles blended with 82%~86% (volume fraction) methanol, motor gasoline and additives to improve performance and safety.

This Standard applies to the fuel used in vehicles with methanol gasoline (M85) ignition engines.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB 190, *Labels for Packages of Dangerous Goods*

GB/T 511, *Petroleum products and additives - Method for determination of mechanical admixtures*

GB/T 4756, *Method for manual sampling of petroleum liquids*

GB/T 5096, *Test method for corrosiveness to copper from petroleum products by copper strip test*

GB/T 6283, *Chemical products - Determination of water Karl-Fischer method (general method)*

GB/T 6682, *Water for analytical laboratory use - Specification and test methods*

GB/T 8019, *Standard test method for gum content in fuels - By jet*

5.3 Sampling

5.3.1 Sampling is according to GB/T 4756. Take 2L of sample for inspection and retention.

5.3.2 Sampling shall use amber glass containers. If a metal container is used, the container shall not have welding. Because the solder will corrode and dissolve into the methanol fuel, resulting in contamination of the sample. Plastic containers shall not be used.

5.4 Judgement rules

When the exit-factory inspection results meet the requirements in Table 1, the batch of products is judged to be conforming.

5.5 Re-inspection rules

If the exit-factory inspection results do not meet the technical requirements of Table 1, re-extract double samples for re-inspection according to the provisions of GB/T 4756. If there are still items that do not meet the technical requirements in Table 1, the batch of products will be judged to be nonconforming.

6 Marking, packaging, transportation and storage

6.1 Methanol gasoline (M85) for motor vehicles is flammable liquid and contains drugs, which is irritating. Its marking, packaging, transportation and storage and delivery acceptance are carried out in accordance with NB/SH/T 0164, GB 12268, GB 13690, GB 30000.7 and GB 190.

6.2 Any fuel dispenser pump and container used for methanol gasoline (M85) for motor vehicles sold to users that comply with this Standard shall be marked with "Methanol gasoline for vehicles (M85)". According to GB 12268, GB 13690, GB 30000.7 and GB 190, flammable liquids and signs of drugs shall be marked. The above signs shall be marked in a place that is easily visible to the driver of the vehicle.

6.3 Methanol gasoline (M85) for motor vehicles conforming to this Standard shall use special pipes, containers and pumps during transportation and storage. The seals and materials of these storage tanks, pumps, pipelines, and gauges shall meet the requirements of methanol gasoline (M85) for motor vehicles. During storage and transportation, ensure that the entire system is clean and free of water. At the same time, the inhalation of external water shall be strictly prevented. A breathing valve with desiccant must be installed on the finished product storage tank. If phase separation occurs, special handling shall be performed.

6.4 Unprotected aluminum and unlined nitrile rubber dispensing hoses shall be avoided in dispensing and metering systems for methanol gasoline (M85).

NOTE: The use of unprotected aluminum components in dispensing and metering equipment for methanol gasoline (M85) for motor vehicles can lead to insoluble aluminum compounds entering the fuel and clogging automotive fuel filters. Also, even with protective aluminum components, this corrosion effect is exacerbated by the increased conductivity of the fuel due to the fuel's contact with the nitrile rubber dispensing hose.

7 Safety

7.1 The data and information related to safety in the transportation, storage, use and accident handling of methanol gasoline (M85) for motor vehicles shall be included in the "chemical safety data sheet" of the product. Manufacturers or suppliers shall provide their product "chemical safety data sheet" prepared in accordance with GB/T 17519.

7.2 Methanol vapor in methanol gasoline (M85) for motor vehicles has a stimulating effect on the nervous system. Inhalation into the human body can cause blindness and poisoning. Therefore, when loading, unloading and refueling, try to reduce the volatilization of methanol gasoline (M85) vapor for vehicles. Mouth, eyes and skin shall not come into contact with this product. Avoid breathing methanol gasoline (M85) vapors for vehicles. Preparation, loading and unloading, refueling personnel shall take corresponding protective measures. Avoid excessive inhalation of harmful vapors.

7.3 Once the methanol gasoline (M85) for motor vehicles is splashed into the skin and eyes, rinse immediately with plenty of water and seek medical attention immediately.

7.4 It shall not use mouth suction for methanol gasoline (M85) for motor vehicles. Do not use methanol gasoline (M85) for motor vehicles to wash hands, scrub clothes, machine parts, fill lighters and use as fuel for torches.

7.5 When using methanol gasoline (M85) to catch fire, use sand, fluoroprotein anti-solvent foam fire extinguishing agent, asbestos cloth and other fire extinguishing materials for firefighting. When methanol gasoline (M85) for motor vehicles overflows, special treatment shall be carried out.

A.4.4 Nitrogen: Purity is 99.998% (volume fraction); used to prepare TCEP micro-packed columns.

WARNING - Pressurized gas.

A.4.5 Tert-amyl alcohol (2-methyl-2-butanol): Purity is above 99% (mass fraction); used as the internal standard.

WARNING - Flammable and harmful to health.

A.5 Column packing preparation

A.5.1 TCEP packed column preparation

A.5.1.1 Any column can be used as long as it can retain methanol and tert-amyl alcohol (internal standard) in methanol gasoline (M85) from hydrocarbons in the same boiling range.

A.5.1.2 10g of TCEP is dissolved in 100mL of dichloromethane. Then add 40g of 150μm~180μm (100/80 mesh) red diatomite carrier P(AW) to the above solution. Quickly transfer these mixtures to an evaporating dish and place in a fume hood. There is no need to wipe off the residual filling deposited on the container. Continuously and gently stir the filling until all solvents are evaporated. The column packing can be used directly to prepare TCEP columns.

A.5.2 Packing of micro-packed column TCEP

A.5.2.1 Use methanol to wash a stainless-steel column tube with a length of 560mm and an outer diameter of 1.6mm (inner diameter of 0.3mm). Then use compressed nitrogen to dry.

A.5.2.2 Insert a plug made of 6-12 silver-plated wires or stainless-steel mesh into one end of the column tube. Slowly add 0.14g~0.15g of packing material to the other end of the column. Shake the column gently during the filling process to pack the packing. And add a plug to the charging end. When plugging the column with wire or stainless-steel mesh plug, leave 6.4mm at both ends of the column to ensure that the packing does not flow out.

A.5.2.3 Both TCEP and WCOT columns shall be briefly conditioned before use. Connect the column to the valve in the column oven (see A.7.1). Adjust the carrier gas flow according to A.7.3. Put the valve in the reset position. After a few minutes, increase the oven temperature to 120°C, and keep it for 5min~10min. Cool the column to 60°C before turning off the carrier gas.

A.6 Sampling

A.6.1 To obtain a representative sample for testing, use the procedure specified

in GB/T 4756 for sampling.

A.6.2 Methanol gasoline (M85) samples for motor vehicles shall be stored in a refrigerator until the time of testing. If it cannot be analyzed immediately, the sample shall be placed in the refrigerator.

A.6.3 The sample container shall be sufficiently shaken before taking the sample for analysis. Allow particles to settle at the bottom of the sample container. Observe the samples for significant phase separation. If so, the sample will be discarded and a re-collection of the sample will be required.

A.7 Instrument preparation and conditioning

A.7.1 Assembly

Use low-volume connectors and fine bore tubing to connect the WCOT column to the valve system. It is important to minimize the dead volume of the chromatographic system connections, otherwise the chromatographic peaks will be broadened.

A.7.2 Operation conditions

Adjust operating conditions according to Table A.1 (if using a TCD, do not open the detector circuit). The system shall be tested before operation.

A.7.3 Adjustment of split ratio

A.7.3.1 See Figure A.1 for split ratio adjustment.

A.7.3.2 Set the valve in reset position. Install a soap bubble flowmeter at the column vent. Adjust the injection port pressure to a flow rate of 5.0mL/min.

A.7.3.3 Install the flowmeter in the vent of the split vent. Use a gas path flow controller to adjust this flow to 70mL/min. If necessary, recheck the outlet flow in accordance with A.7.3.2.

A.7.3.4 Switch the valve to the backflush position. Adjust the resistance valve to make the column outlet flow the same as A.7.3.2. This is necessary to minimize flow changes when the valve is switched.

A.7.3.5 Switch the valve to the injection reset position. Adjust the B flow controller so that the flow at the detector outlet is 3.0mL/min~3.2mL/min. According to specific instrument needs, add auxiliary gas or TCD flow, so that the total flow at the detector outlet is 21mL/min.

A.7.4 Detector

When using a thermal conductivity detector, open the thermal conductivity

Annex B

(Normative)

Determination of inorganic chlorine content in methanol gasoline (m85) for motor vehicles

B.1 Method summary

Use silver ion composite electrode as working electrode. Use automatic potentiometric titration. Use silver nitrate standard titration solution to titrate the chloride ions in methanol gasoline (M85) for motor vehicles. The maximum point of the potential change rate dU/dV with the volume of the titrant used is the end point of the titration. Calculate the chloride ion content in methanol gasoline (M85) for motor vehicles according to the consumption of silver nitrate standard titrant.

B.2 Instruments and equipment

B.2.1 Automatic potentiometric titrator: Model is 809TitrandoMetrohm; resolution is 0.1mV; accuracy is 0.2%.

B.2.2 Electrode: Silver ion composite electrode: Ag/AgCl, 6.0726.100 Metrohm.

B.2.3 Magnetic stirrer: A magnetic stirrer bar is available.

B.2.4 Micro-burette: 10mL.

B.2.5 Volumetric flasks: 10mL, 1000mL.

B.2.6 Pipette: 50mL.

B.3 Reagents and solutions

B.3.1 Reagent specifications

The reagents used in this test method, unless other specifications are specified, are all analytically pure, and the water used meets the specifications of grade two water and above in GB/T 6682.

B.3.2 Nitric acid solution (1+3)

Measure 1 volume of concentrated nitric acid. Mix with 3 volumes of water.

B.3.3 Sodium chloride standard solution (100mg/L, calculated as chloride ion)

Weigh 0.1648g of sodium chloride, the benchmark reagent, which is calcined at 500°C to 600°C and has a constant weight. Use a little water to dissolve first. Then transfer all to a 1000mL volumetric flask. Use water to set volume. Shake well for future use.

B.3.4 Silver nitrate standard titration solution [ρ($AgNO_3$) = 1.699g/L]

B.3.4.1 Preparation

Weigh 1.75g of silver nitrate. Use a little water to dissolve first. Then transfer all to a 1000mL volumetric flask. Use water to set volume. Shake well. The solution is stored in a brown reagent bottle.

B.3.4.2 Calibration

Calibration is according to GB/T 9725. Weigh 0.22g of sodium chloride, the reference reagent, calcined at 500°C~600°C with constant weight, into a 200mL beaker. Add 70mL of water to dissolve it completely. Add 10mL of starch solution (10g/L). Use the 216-type silver electrode as the indicator electrode, and the 217-type double-salt bridge saturated calomel electrode as the reference electrode. Use prepared silver nitrate standard titration solution to titrate. The maximum point of the potential change rate dU/dV with the volume of the titrant used is the end point of the titration. Calculate the volume V of the standard titration solution of silver nitrate consumed when the titration reaches the end point according to the second-level micro-commercial method in GB/T 9725.

B.3.4.3 Calculation

The actual concentration of silver nitrate standard titration solution is calculated according to formula (B.1):

$$\rho(AgNO_3) = m \times 1\,000/(58.442 \times V) \times 169.869 \quad \cdots\cdots (B.1)$$

where,

ρ($AgNO_3$) - The mass concentration of silver nitrate standard titration solution, in grams per liter (g/L);

m - The exact value of the mass of sodium chloride, in grams (g);

V - The volume of silver nitrate standard titration solution consumed when titrating to the end point, in milliliters (mL);

58.442 - The molar mass of sodium chloride, in grams per mole (g/mol);

169.869 - The molar mass of silver nitrate, in grams per mole (g/mol).

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