

ICS 75.100
CCS E 30



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

GB 11133-1989

Replacing GB/T 11133-1989

**Standard test method for determination of water in petroleum
products, lubricating oils, and additives -- Coulometric Karl
Fischer titration method
(English Translation)**

Issued on: December 31, 2015

Implemented on: June 1, 2016

Issued by: Standardization Administration of China

Table of Contents

Foreword
Introduction
1 Scope
2 Normative references
3 Method Summary

Foreword

This standard was drafted in accordance with GB/T 1.1-2009 given rules.

This standard replaces GB/T 11133-1989 "Liquid petroleum products - Determination of water (Karl Fischer method)", and GB/T 11133-the main technical changes compared to 1989 are as follows.

- Standard name from "Liquid petroleum products - Determination of water (Karl Fischer method)" to "petroleum products, lubricants and additives Determination of water content Karl Fischer coulometric titration method";
- Measurement methods by Karl Fischer volumetric method to the Karl Fischer coulometry;
- Expanding the range of the method of measuring the water content (see Chapter 1);
- Increase the measured interference factor method analyzes the content (see Chapter 4);
- The sample is expected to increase the water content of the sample injection volume selection table (Table 1);
- Remove the GB/T 11133-1989 preparation in Karl Fischer reagents and calibration Hugh content (see the 1989 edition of the 7.2 and 7.5);
- Increased calibration and standardization of the content of the method (see Chapter 9);
- The test steps are divided into A, B, C three steps to increase the volume of direct titration step B, step C, the water evaporates and the indirect Titration (see Chapter 11 and Chapter 12);
- Increased quality control check the contents (see Chapter 13);
- Modify the water content of the result of the calculation formula (see Chapter 14, 1989 version 8.3);
- Modification method precision and bias increases the content (see Chapter 15, Section

9 of the 1989 edition);

- Modify the content of the report (see Chapter 16, Chapter 10, 1989 edition);
- Modify the contents of Appendix A of the GB/T 11133-1989 technical content as informative annex be added to facilitate Use (see Appendix A, 1989 edition of Appendix A);
- Revised Appendix B content, delete GB/T 11133-1989 Appendix B double platinum electrode production and maintenance instructions (see 1989 edition of Appendix B), to help increase the water content analysis message.

This standard uses redrafted Law Revision using American Society for Testing Materials Standards ASTM D6304-07 "Petroleum products, lubricants and Additives - Determination of water (Karl Fischer coulometric titration method)." the main differences between standard and ASTM D6304-07 follows.

- References corresponding national standards and industry standards of Chapter 2 in the normative references;
- In Chapter 5, an increase of 5.4 instrument balance requirements;
- Modified ASTM D6304-07 7.2 and 7.5 on the water content of xylene and n-hexane reagent requirements (see 6.2 and 6.4);
- 6.3.3 adds single-component Karl Fischer electrolyte requirements;
- In Chapter 8, the instrument is ready to add a 8.4 single-component Karl Fischer electrolyte use;
- To increase the content of Appendix A, gives GB/T 11133-1989 technical content, ease of use.

This standard by the National Standardization Technical Committee on products and lubricant oil (SAC/TC280) proposed.

This standard by the National Standardization Technical Committee of petroleum products lubricants oil and lubricants and fuels Technical Committee (SAC/TC280 /SC1) centralized.

This standard was drafted. China Petroleum and Chemical Corporation lubricants branch.

Introduction

In lubricants, additives and similar products production, procurement, marketing and transportation, to understand the size of the water content in the prediction of oil quality Capacity and performance characteristics of a great help.

For oil products, the presence of trace amounts of water will cause the device to premature corrosion and wear, thereby increasing the wear debris can cause lubricating effect the decline and premature clogging of the filter. In addition, the presence of trace amounts of

water will hinder the effectiveness of the additive to play and contribute to harmful bacteria Growth.

Petroleum products, oils and additives in water content Determination of Karl Fischer coulometric titration Warning --- application of this standard may involve some hazardous materials, operations and equipment, but not all of the security relating thereto Issues recommendations. Users Before using this standard has the responsibility to develop appropriate security and protection measures, and determine the relevant regulatory restrictions applicable Versatility.

1 Scope

This standard specifies the use of the automatic titrator direct determination of petroleum products and hydrocarbons in water content approach. Direct titration the water content in the range of 10mg/kg ~ 25000mg/kg. This standard also specifies the method of indirect determination of water content of the sample by heating the party Method, the sample was separated in the water by a dry inert gas loaded into the Karl Fischer titrator analyzed. Thiol, sulfide, and other Interfering compounds on test methods see Chapter 4.

This standard applies to the use of a commercially available coulometric Karl Fischer reagent of additives, lubricants, base oils, automatic transmission fluids, hydrocarbon solvents and He petroleum products in water content. By selecting a suitable sample injection volume, the water content of the standard measurement range from mg/kg to the level of quality the percentage of volume level.

NOTE: Karl Fischer volumetric method for the determination of water content of liquid petroleum products method see Appendix A.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 1884 crude oil and liquid petroleum products - Laboratory determination of density (density meter method) (GB/T 1884-2000, eqv ISO 3675.

1998)

GB/T 1885 Petroleum Measurement Tables (GB/T 1885-1998, eqv ISO 91-2:1991) GB/T 4756 petroleum liquids hand sampling method (GB/T 4756-1998, eqv ISO 3170. 1988) GB/T 6682 analytical laboratory use specifications and test methods (GB/T 6682-2008, ISO 3696. 1987, MOD) SH/T 0604 crude oil and petroleum products densitometry (U-shaped vibrating tube method) (SH/T 0604-2000, eqv ISO 12185.

1996)

ASTMD5854 mixing and processing SOPs Petroleum and liquid petroleum product sample
(PracticeforMixingand HandlingofLiquidSamplesofPetroleumandPetroleumProducts)
Standard methods (TestMethodforWaterUsingVolumetric Determination of water content
Karl Fisher titration ASTM E203 KarlFischerTitration)

3 Method Summary

3.1

The amount of sample was added to the coulometer Karl Fischer titration cell, iodine and sample titration cell anode produced water according to the reaction Stoichiometry, according to the ratio of 1 Karl Fischer reaction occurs. When all the water consumed after the reaction of the titration cell, by detecting titrator Measuring the electrical signal generated by an excess of iodine, determine the endpoint and terminates the titration. Therefore, according to Faraday's law, the amount of water and titrate the total score Current proportional relationship.

A sample injection volume of 3.2 units of measurement may be units of mass or volume units.

3.3

viscosity or the presence of a large sample interfere with the reaction may be used to measure the water evaporator. The sample was added to the water evaporator heating,