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

**GB/T 7304-2014**

Replacing GB/T 7304-2000

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**Standard test method for acid number of petroleum products by  
potentiometric titration**

石油产品酸值的测定 电位滴定法

**(English Translation)**

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## Foreword

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

This standard replaces GB/T 7304-2000 "Petroleum products and lubricants - Determination of acid method (potentiometric titration)." This standard GB/T 7304-2000 compared to the main technical changes are as follows.

- Name to "acid number of petroleum products by potentiometric titration";
- To increase the scope of biodiesel and biodiesel blended fuel was measured in acid number;
- The standards are divided into A, B two methods, Method B content is newly added;
- Reference electrode in electrolytic solution filled modify 1mol/L ~ 3mol/L ethanol electrolyte lithium chloride;
- Deletion of pyridine and 2,4,6-trimethyl-nitro-m-cresol requirements;

- Remove the preparation method of the non-aqueous buffer solution of relevant content;
- Detecting electrode system requirements for pH values between 4 and 7 aqueous buffer solution of the difference between the potential value of greater than 162mV can;
- Original standard 8.3 as a separate chapter, namely Chapter 9;
- In aqueous buffer solution of the potential value of the titration end point as a non-significant turning point in time;
- Increased quality control checks of the contents;
- Modified precision;
- Added Appendix A (informative), the original Appendix A (informative appendix) to Annex B (informative).

This standard uses redrafted law revision adopted ASTM D664-11a "Petroleum products - Determination of acid number (potentiometric titration)." Technical differences between this standard and ASTM D664-11a and the reasons are as follows.

- Terms and definitions are added to the definition of a strong acid value;
- References of standards adopted corresponding national standards and industry standards;
- Increased ordinary reference electrode, because of domestic casing reference electrode so few in this standard reference electrode and the casing Domestic universal reference electrode can be used;
- Increasing the preparation of an aqueous buffer solution;
- Added Appendix B (informative) "synthetic acid value measurement requirements." this standard by the National Standardization Technical Committee on products and lubricant oil (SAC/TC280) proposed.

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

This standard was drafted. China PetroChina Lanzhou lubricant research and development centers.

## 1 Scope

This standard specifies the analyzes of the two measuring petroleum products, lubricants, biodiesel and biodiesel blended fuel acid number potentiometric titration Setting Method.

A suitable method can be dissolved and substantially dissolved in toluene and anhydrous isopropanol mixed solvent of petroleum products and lubricants acid value Determination.

Method A sample can be determined as those in the water dissociation constant greater than  $1 \times 10^{-9}$  acidic component, the dissociation constant of less than  $1 \times 10^{-9}$  Extremely weak acids do not interfere, but hydrolysis constant is greater than  $1 \times 10^{-9}$  salts will participate in the reaction, the precision of Method A is the acid value (in KOH basis) of 0.1mg/g ~ 150mg/g in the range established.

Method B has a low acidity and is suitable for measuring large differences in solubility of biodiesel and biodiesel blended fuel acid number.

**Note:** The new oil or used oil is acidic components include organic acids, inorganic acids, esters, phenolic compounds, lactones, resins, and heavy metal salts, ammonium salts and other weak base Salts, polycarboxylic acids and acid salts of certain antioxidants and detergent additive.

This standard reflects the relative displacement of oil during use under oxidizing conditions occur without regard to color and other performance changes premise of. Although the titration is carried out under certain conditions, but this standard can not be used to determine the absolute acidity of oil to predict its use state Performance, did not find a causal link between the acid value and bearing corrosion.

**Note 1:** The acid value of the results by this standard and measured by GB/T 4945 and SH/T 0163 measured results may be the same or may be different. This standard does not Try the measurement result of the measurement results and other ways to get non-titration was associated.

**Note 2:** There are observed when using an aqueous or non-aqueous buffer solution in this standard, there are some differences between the results obtained are few laboratories.

## 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 4756 petroleum liquids hand sampling method (GB/T 4756-1998, eqvISO 3170. 1988) GB/T 4945 Petroleum products and lubricants - Determination of acid and base number (Color Indicator Method) GB/T 6682-2008 analytical laboratory use specifications and test methods (ISO 3696. 1987, MOD) SH/T 0079 Petroleum products testing reagent solution preparation method SH/T 0163 Petroleum products - Determination of total acid (Semi - Micro Color Indicator Method) SY/T 5317 petroleum liquids pipeline automatic sampling (SY/T 5317-2006, ISO 3171. 1988, IDT)

## 3 Terms and Definitions

The following terms and definitions apply to this document.

Acid value acidnumber the specimen in the specified solvent base titration end point is specified to be used in an amount in dollars KOH, in units of mg/g.

**Note:** The use of this standard in the base is dissolved in a mixed solvent containing toluene, anhydrous isopropanol and a small amount of water per gram of sample from the initial potentiometric titration A new quality to the appropriate aqueous alkaline buffer solution with a potential value or titration to this standard when the inflection point using potassium hydroxide (in milli Grams) represented.

Acid value strongacidnumber Amount and 1g sample strongly acidic components required for a base to KOH counted in units of mg/g.

**Note 1:** This standard will be dissolved in a mixed solvent per gram of sample from the initial to the corresponding new potentiometric titration with an acidic aqueous buffer solution potential value or standard when the inflection point in a predetermined KOH used to count (in units of mg/g) The amount of the base value is reported as a strong acid.

**Note 2:** Due to production and to acid components and other acidic components are different, so when the user of this standard after the discovery of these two components, respectively, should be to report.

## 4 Summary

The sample is dissolved in a solvent in the titration, potassium hydroxide standard solution as titrant isopropanol potentiometric titration, electrodes used for glassy Electrode and a reference electrode or composite electrode glass indication. Manual or automatic drawing draw potential mV value corresponding to the volume of the titration potentiometric titration song Line, and the apparent jump point as the end point, if there is no obvious jump points are measured potential values for the corresponding new feature aqueous buffer solution of acid and base the endpoint of the titration.

## 5 Methods

### 5.1

with new or petroleum products, biodiesel and biodiesel blended fuel additives, there may be some in the form of oil or in making During use of the degradation products (e.g., oxidation products) in the form of an acidic component. It can be determined by titration with an alkaline solution containing these substances relative the amount of acid value is measured under specified conditions have these substances in the amount of oil in the acid value can be used to control the quality of lubricating oil in the formulation studies, Sometimes it can also be used to determine the lubricating oil in the course of the degradation, but the acid value as a lubricant scrapped indicators should be determined by experience.

### 5.2

Due to the various oxidation products contribution acid number is different, and corrosion properties of different organic acids are also different, so the standard it can not be used to