

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

SN/T 4675.3-2016

**Determination of the stable carbon isotope ratio of ethanol in
wine for export**

出口葡萄酒中乙醇稳定碳同位素比值的测定

(English Translation)

Issued on: December 12, 2016

Implemented on: July 1, 2017

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine**

Table of Contents

- Foreword
- 1 Scope
- 2 Normative references
- 3 Method summary
- 4 Reagents and materials
- 5 Instruments and equipment

Foreword

SN/T 4675 "export wine quality and safety analysis method" is divided into 30 parts.

- SN/T 4675.1 Determination of export glycerol in the enzyme method;
- SN/T 4675.2 Export wine 2,3-butanediol Determination of gas chromatography;
- Determination of stable carbon isotope ratio of ethanol in exported wine by SN/T 4675.3;
- SN/T 4675.4 Determination of lactic acid in export wine enzymatic;
- SN/T 4675.5 wine exports - Determination of organic acids by ion chromatography;
- SN/T 4675.6 Determination of glucose, fructose and sucrose in export wines;
- SN/T 4675.7 Determination of acetaldehyde in wine exports - Gas Chromatography - Mass Spectrometry;
- SN/T 4675.8 Export wine 5-hydroxymethyl furfural Determination of liquid chromatography;
- SN/T 4675.9 Exported wine - Determination of diethylene glycol - Gas Chromatography - Mass Spectrometry;
- SN/T 4675.10 Determination of ochratoxin A in export wines - Liquid chromatography - mass spectrometry/mass spectrometry;
- SN/T 4675.11 Determination of 7 kinds of anthocyanins in exported wine by ultra performance liquid chromatography;
- SN/T 4675.12 export wine lysozyme Determination of liquid chromatography;
- SN/T 4675.13 Determination of 2,4,6-trichloroanisole residues in exported wine;
- SN/T 4675.14 Determination of natamycin in wine exports by liquid chromatography - mass spectrometry/mass spectrometry;

- SN/T 4675.15 exported wine salicylic acid, dehydroacetic acid and p-chlorobenzoic acid Determination of liquid chromatography;
- SN/T 4675.16 Determination of fumaric acid in exported wine by liquid chromatography - mass spectrometry/mass spectrometry;
- SN/T 4675.17 Determination of butyl tin content in exported wine - Gas Chromatography - Mass Spectrometry/Mass Spectrometry;
- SN/T 4675.18 Determination of dithiocarbamate residues in export wines; headspace gas chromatography;
- Determination of sodium, magnesium, potassium, calcium, chromium, manganese, iron, copper, zinc, arsenic, selenium, silver, cadmium and lead in exported wines;
- SN/T 4675.20 Determination of rare earth elements in exported wine by inductively coupled plasma mass spectrometry;
- SN/T 4675.21 Determination of soluble inorganic salts exported wine Ion chromatography;
- SN/T 4675.22 Determination of total sulfur dioxide in wine exports colorimetry;
- SN/T 4675.23 Determination of ammonia nitrogen in wine and grape juice exports continuous flow analyzer;
- SN/T 4675.24 Export wine Fulin - Schock Index Determination spectrophotometer;
- SN/T 4675.25 Determination of color of export wine CIE1976 (L * a * b *) color space method;
- SN/T 4675.26 Determination of turbidity of exported wine - Scattered light method;
- SN/T 4675.27 Determination of export wine alkaline ash;
- SN/T 4675.28 exports of wine bacteria, mold and yeast count;
- SN/T 4675.29 Export wine wine yeast test real-time fluorescent PCR;
- SN/T 4675.30 Exported wine Bayer engaged yeast test real-time PCR method.

This part of the SN/T 4675 Part 3 this section drafted in accordance with GB/T 1.1-2009 given rules.

This section to amend the method adopted by the International Organization of grapes and wine (OIV) OIV-MA-AS312-06 "Determination of isotope ratio mass spectrometry Wine or grape juice, grape juice concentrate, glucose fermentation ethanol $^{13}\text{C}/^{12}\text{C}$ value determination method "" Determination by isotope ratiomassspectrometry $^{13}\text{C}/^{12}\text{C}$ of wine ethanol or that obtained through the fermentation of musts, concentrated musts or grapesugar.). This section is consistent with the method in technical

content, but taking into account the special characteristics of our own standards Points and Chinese expression habits, the contents of the OIV method OIV-MA-AS312-06 made editorial changes, the main content of the amendment.

--- Increase the method and steps of alcohol distillation in wine.

This part of the national certification and accreditation supervision and management committee proposed and centralized.

This part of the drafting unit. People's Republic of China Qinhuangdao Exit Inspection and Quarantine, People's Republic of China Guangdong Exit Inspection and Quarantine Epidemic

1 Scope

This part of SN/T 4675 specifies the method of stable isotope ratio mass spectrometry for the determination of ethanol stable carbon isotope ratios in wine.

This section applies to the determination of ethanol stable carbon isotope ratio in wine.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document.

Laboratory use specifications and test methods for analysis GB/T 6682-2008

3 Method summary

In photosynthesis, plants absorb carbon dioxide mainly C3 mechanism and C4 mechanism. These two mechanisms have different types of parity Sup fractionation type. The ^{13}C content in C4 products and their fermented products (such as sugar and ethanol) derived from C3 plants is ^{13}C Higher content. Grapes belong to the C3 plant, and sugarcane and corn belong to the C4 plant. By detecting the content of ^{13}C , addition to the grape can be detected Sugars derived from C4 plants (sugarcane or cereal) in products such as wine.

This standard uses automatic distillation control system to distill the alcohol in the wine, the ethanol in the combustion furnace into CO_2 , the After purification and separation, the carbon isotope ratio ($^{13}\text{C}/^{12}\text{C}$) of CO_2 was determined using a stable isotope ratio mass spectrometer, which was calculated by comparison with a standard substance the $\delta^{13}\text{C}$ value of ethanol in wine.

4 Reagents and materials

Water GB/T 6682-2008 provides a water.

4.1

Diatomaceous earth. Chromosorbw, 30 mesh ~ 80 mesh.

4.2

sucrose standard material ($\delta^{13}\text{CPDB} = -26.03 \pm 0.02\%$). Before use, weighed 380.02mg, dissolved in deionized water, fixed volume to 1mL. When measuring the sample, 5 μL of the sample was transferred to a tin cup containing diatomaceous earth (4.1), and sealed and sealed into a ball shape for quantitative standard and quality control sample.

4.3

Helium (He) Purity $\geq 99.999\%$.

4.4

Oxygen (O_2). Purity $\geq 99.999\%$.

4.5

Carbon dioxide gas (CO_2) Purity $\geq 99.99\%$.

5 Instruments and equipment

5.1

Stable Isotope Ratio Mass Spectrometer.

5.2

Automatic distillation control system, or other distillation system of the same performance to ensure that the distilled liquid collected $\delta^{13}\text{C}$ value with the standard value of the difference Value less than 0.5 per mille, ethanol isotope fractionation. Distillation flask volume 500mL, fraction collection temperature $78.0\text{ }^\circ\text{C} \sim 78.5\text{ }^\circ\text{C}$.