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ICS 13.080.10
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LY

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

LY/T 1228-2015

Replacing LY/T 1228-1999; LY/T 1229-1999; LY/T 1230-1999; LY/T 1231-1999

Nitrogen determination methods of forest soils

森林土壤氮的测定

(English Translation)

Issued on: October 19, 2015 **Implemented on: January 1, 2016**

Issued by: State Forestry Administration

Preview: page 1 of 5 shown, 15 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/ly-t-1228-2015

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Table of Contents

Foreword
Introduction
1 Scope
2 Normative references
3 Determination of total nitrogen
3.1 Kjeldahl method

Foreword

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

This standard replaces LY/T 1228-1999 "Determination of total nitrogen in forest soil", LY/T 1229-1999 "Measurement of hydrolyzable nitrogen in forest soil" Ding, LY/T 1230-1999 "Determination of nitrate nitrogen in forest soils" and LY/T 1231-1999 "Determination of ammonium nitrogen in forest soils".

This standard is compared with LY/T 1228-1999, LY/T 1229-1999, LY/T 1230-1999 and LY/T 1231-1999.

To change as follows.

--- Added normative references;

--- Determination of total nitrogen increased continuous flow analyzer method and elemental analyzer method;

--- Determination of nitrate nitrogen increased the continuous flow analyzer method;

--- Determination of ammonium nitrogen by the indophenol blue colorimetric method and continuous flow analyzer method;

--- Removed the diffusion method for total nitrogen determination;

---Delete the determination method of ammonium nitrogen in forest soil of LY/T 1231-1999 (magnesium oxide leaching---diffusion method);

--- Modified the Kjeldahl method for total nitrogen determination. semi-automatic nitrogen analyzer and fully automatic nitrogen analyzer instead of semi-micro Kjeldahl distillation unit;

Soil digestion increases the digestion step including nitrate nitrogen and nitrite nitrogen; the distillation and titration steps of ammonium nitrogen are modified.

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https://chinastandards.org/standards/ly-t-1228-2015

This standard is proposed and managed by the State Forestry Administration.

This standard was drafted. Forestry Research Institute of Chinese Academy of Forestry.

Introduction

The method for determining total nitrogen in soil is mainly divided into two types. wet burning method and dry burning method. The wet burning method is the sulfuric acid digestion method, and the ammonium nitrogen in the digestion liquid the measurement methods include a distillation titration method, a diffusion method, and a colorimetric method. Among them, the Kjeldahl method, which is titrated by distillation, is most commonly used.

More improvement, currently used by semi-automatic nitrogen analyzer and automatic nitrogen analyzer. Total nitrogen determination can also be performed using a continuous flow analyzer method the manual operation is simplified to the automated monitoring of the instrument and the batch samples can be tested continuously. The dry burning method was founded by Dumars in 1831, but Because the early Dumas method can only detect a few milligrams of samples, its practical application has been greatly limited. In recent years, various automatic the development of elemental analyzers has made dry burning more and more popular as a routine analysis method for soil elements.

The available nitrogen in the soil varies greatly. The hydrolyzable nitrogen is generally determined by alkali diffusion method in China. This method is easy to operate and the reproducibility of the results is better.

Good, and there is a certain correlation with the nitrogen requirement of forest trees. In recent years, countries have widely used soil ammonium and nitrate nitrogen to replace previous soils.

Hydrolyzable nitrogen index. The determination of ammonium in soil is mainly divided into two methods. direct distillation and leaching. Direct distillation may make the result higher.

At present, it is leached with neutral salt (K2SO4, KCl, NaCl, etc.) solution, generally with 2mol/L KCl solution, ammonium in the extract the nitrogen can be determined by distillation, colorimetric, ammonia electrode and continuous flow analyzer. Determination of soil nitrate nitrogen, first soluble in water or neutral salt for liquid extraction, it is required to prepare a clear and colorless extract. The nitrate nitrogen in the extract can be colorimetric, reductive distillation, electrode method, ultraviolet spectrophotometry.

Determined by the method and the continuous flow analyzer method.

Determination of nitrogen in forest soil

Preview: page 3 of 5 shown, 15 in the full document. Complete English PDF, instant download:
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1 Scope

This standard specifies the method for determining soil nitrogen in forests. It is determined by Kjeldahl method, continuous flow analyzer method and elemental analyzer method.

Determination of Soil Hydrolyzable Nitrogen in Forest Soil by Total Nitrogen and Alkali Diffusion and Diffusion Method, Determination of Nitrate Nitrogen and Ammonium in Forest Soil by Colorimetric Method and Continuous Flow Analyzer State nitrogen.

This standard applies to the determination of total nitrogen, hydrolyzable nitrogen, nitrate nitrogen and ammonium nitrogen in forest soil.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

Preparation of GB/T 601 chemical reagent standard titration solution Preparation of preparations and products used in GB/T 603 test method GB/T 6682 Analytical laboratory water specifications and test methods LY/T 1210-1999 Collection and preparation of forest soil samples

3.1.1 Method points

The total nitrogen in the soil is decomposed with concentrated sulfuric acid, converted to ammonium nitrogen, alkalized with sodium hydroxide, heated and distilled under the participation of an accelerator.

The ammonia is absorbed by boric acid and titrated with an acid standard solution to determine the total nitrogen content of the soil (not including nitrate nitrogen and nitrite nitrogen). Including nitrate nitrogen and nitrous oxide Determination of total nitrogen in the soil of nitrogen, before the sample is digested, it is necessary to first oxidize the nitrite nitrogen in the sample to nitrate nitrogen before using the potassium permanganate.

The original iron powder reduces nitrate nitrogen and nitrite nitrogen and converts it into ammonium nitrogen.

3.1.2 Reagents

All reagents were of analytical grade except as noted. Analytical water should meet the specifications of the secondary water in GB/T 6682. Required in the test Standard titration solutions, preparations and products are prepared in accordance with GB/T 601 and GB/T 603 when no other requirements are indicated.

Preview: page 4 of 5 shown, 15 in the full document. Complete English PDF, instant download:
https://chinastandards.org/standards/ly-t-1228-2015

3.1.2.1 Digestion accelerator

Potassium sulfate (K_2SO_4) and copper sulfate pentahydrate ($CuSO_4 \cdot 5H_2O$) were mixed at 10.1, finely ground in a mortar, and thoroughly mixed.

3.1.2.2 Sulfuric acid

H_2SO_4, rho = 1.84 g/mL.

3.1.2.3 Hydrochloric acid

HCl, rho = 1.19 g/mL.

Preview: page 5 of 5 shown, 15 in the full document. Complete English PDF, instant download:
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