

ICS 65.080
CCS G 20

NY

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

NY/T 1972-2010

**Water-soluble fertilizers - Determination of sodium, selenium,
silicon content**
(English Translation)

Issued on: December 23, 2010

Implemented on: February 1, 2011

Issued by: Ministry of Agriculture of the People's Republic of China

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Foreword

This standard was drafted in accordance with the provisions of GB/T 1.1-2009.

This standard was proposed by AND shall be under the jurisdiction of the Ministry of Agriculture of the People's Republic of China.

The drafting organizations of this standard. National Fertilizer Quality Supervision and Inspection Center (Beijing), Ministry of Agriculture - Fertilizer Quality Supervision and Inspection Center (Chengdu), AND Ministry of Agriculture - Fertilizer Quality Supervision and Inspection Center (Ji'nan).

1 Scope

This standard specifies the test methods for the water-soluble fertilizers - sodium, selenium, AND silicon content measurement.

This standard applies to measurement of liquid OR solid water-soluble fertilizers - sodium, selenium, AND silicon content.

2 Normative references

The following documents are essential to the application of this document.

For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this Standard.

GB/T 8170 Rules of rounding off for numerical values & expression and

judgment of limiting values

HG/T 2843 Chemical fertilizer products - Standard volumetric, standard

reagent and indicator solutions for chemical analysis

NY/T 887 Density testing of liquid fertilizer

3.1.1 Principle

The sodium atoms in the sample solution are excited by the thermal energy of the flame; when the excited electron is transited from a higher energy level to a lower energy level, it can release a certain energy, which will generate the spectral line of a fixed wavelength; USE the optical system to measure the radiant energy, in order to obtain the sodium content.

3.1.2 Reagents and materials

WEIGH 0.2 g ~ 3 g sample (accurate to 0.0001 g); PLACE it into a 250mL volumetric flask; USE water to make it reach to constant volume; MIX it uniformly; dry FILTER it; DISCARD the first few milliliters of filtrate; USE the rest filtrate for measurement.

3.1.4.3 Drawing of working curve

Respectively PIPETTE 0 mL, 1.00 mL, 2.00 mL, 3.00 mL, 4.00 mL, 5.00 mL,

6.00 mL, AND 7.00 mL of sodium standard solution (3.1.2.2) into eight 100

mL volumetric flasks; USE water to make it reach to constant volume; MIX it uniformly. The sodium's mass concentration of this standard series solution is respectively 0 µg/mL, 1.00 µg/mL, 2.00 µg/mL, 3.00 µg/mL, 4.00 µg/mL,

5.00 µg/mL, 6.00 µg/mL, AND 7.00 µg/mL. On the flame photometer of

selected working conditions, based on the sodium concentration of the solution to be tested, SELECT six points from the standard series solution; USE the 0 µg/mL standard solution to adjust the zero point of the instrument; from low concentration to high concentration, respectively MEASURE the emission intensity of each standard solution. USE the sodium's mass

concentration of each standard series solution ($\mu\text{g/mL}$) as the abscissa AND the corresponding emission intensity as the ordinate; DRAW the working curve.

3.1.4.4 Measurement

USE the sample solution OR the solution which is diluted to certain ratio, under the same conditions of the standard series solution for measurement purposes, to measure the emission intensity of sodium; from the working curve, FIND the corresponding mass concentration of the sodium ($\mu\text{g/mL}$).

3.1.4.5 Blank test

Except for not adding of sample, the rest steps are same as the sample solution measurement.

3.1.5 Analysis result presentation

The sodium (Na) content w_1 is expressed in mass fraction (%), AND calculated in accordance with the equation (1).

Where.

ρ - The sodium's mass concentration of the sample solution as found from the working curve, in the unit of micrograms per milliliter ($\mu\text{g/mL}$);

3.2.2.2 Cesium chloride solution. $\rho(\text{CsCl}) = 4 \text{ g/L}$. WEIGH 4 g of cesium chloride and DISSOLVE it in water; USE water to dilute it to 1 L; MIX it uniformly.

3.2.3.2 Horizontal reciprocating oscillators OR oscillators with equivalent functions.

3.2.4.1 Sample preparation

With respect to the solid samples, after multiple times of splitting, TAKE out about 100 g; rapidly GRIND it to the grain which can all pass the 0.50 mm pore size sieve (if the sample is wet, it shall pass through the 1.00 mm pore

size sieve); MIX it uniformly; PLACE it in a clean AND dry container; after the liquid sample is subject to multiple times of shaking, quickly TAKE out about

3.2.4.2.1 Solid sample

WEIGH 0.2 g ~ 3 g of sample (accurate to 0.0001 g); PLACE into a 250 mL volumetric flask; ADD 150 mL of water; PLACE it into the $(25 \pm 5) ^\circ\text{C}$ oscillator; under the oscillating frequency of $(180 \pm 20) \text{ r/min}$, OSCILLATE it for 30 min; TAKE it out; USE water to make it reach to constant volume; MIX it uniformly; dry FILTER it; DISCARD the first few milliliters of filtrate; USE the rest filtrate for measurement.

3.2.4.2.2 Liquid sample

WEIGH 0.2 g ~ 3 g sample (accurate to 0.0001 g); PLACE it into a 250mL volumetric flask; USE water to make it reach to constant volume; MIX it uniformly; dry FILTER it; DISCARD the first few milliliters of filtrate; USE the rest filtrate for measurement.

250 - The volume of the sample solution, in the unit of milliliter (mL);

m - The mass of the sample, in the unit of grams (g);

106 - The coefficient used to convert g to μg .

USE the arithmetic mean of the parallel measurement results as the measurement result, keeping two decimal places.

3.2.6 Allowable difference

The relative difference of the parallel measurement results is not more than 10%;

The relative difference between the measurement results from different laboratories is not more than 30%.

When the measurement result is less than 0.15%, the relative difference of the parallel measurement results AND the measurement results from