

ICS 77.120.01

CCS D 46

YS

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

YS/T 3015.4-2013

**Methods for chemical analysis of gold-loaded carbon. Part 4:
Determination of copper, iron, calcium and magnesium contents.
Inductively coupled plasma-atomic emission spectrometry**

载金炭化学分析方法 第4部分：铜、铁、钙和镁量的测定电感耦合等离子体发射
光谱法

(English Translation)

Issued on: January 1, 1970

Implemented on: January 1, 1970

Issued by: Ministry of Industry and Information Technology

Table of Contents

Foreword
1 Scope
2 Method summary
3 Reagents

Foreword

YS/T 3015 "loaded carbon chemical analysis methods" is divided into four parts.

- Part 1. Determination of moisture content of the dry weight method;
- Part 2. Determination of copper and iron content by flame atomic absorption spectrometry;
- Part 3. Determination of the amount of calcium and magnesium by flame atomic absorption spectrometry;
- Part 4. Copper, iron, calcium and magnesium content - Inductively coupled plasma atomic emission spectrometry.

This section YS/T 3015 Part 4.

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

This part is proposed by the China Gold Association.

This part of the National Gold Standardization Technical Committee (SAC/TC379) centralized.

This section is drafted. Zijin Mining Group Co., Ltd., Changchun Gold Research Institute, the National Gold and Silver Products Quality Supervision and Inspection Heart (Changchun), Henan Zhongyuan gold smelter limited liability company.

1 Scope

This section YS/T 3015 specifies the method for determination of loaded carbon in copper, iron, calcium and magnesium content.

This section applies to the determination of gold contained in copper on carbon, iron, calcium and magnesium content. Measurement range. 0.010% to 2.00% copper; iron ~ 0.010% 1.00%; 0.050% to 2.00% Ca; Mg 0.010% to 0.50%.

2 Method summary

The sample was burning ashed with hydrochloric acid, nitric acid to dissolve the residue. In dilute hydrochloric acid medium, in inductively coupled plasma atomic emission spectroscopy election Under certain conditions, determine the mass concentration of each element in the test solution, according to the standard curve method to calculate copper, iron, calcium and magnesium content.

3 Reagents

Unless otherwise indicated in the analysis using only recognized as analytical grade reagents and distilled or deionized water or equivalent purity.

3.1

hydrochloric acid ($\rho = 1.19\text{g/mL}$).

3.2

hydrochloride (11).

3.3

hydrochloride (14).

3.4

hydrochloride (298).

3.5

nitric acid ($\rho = 1.42\text{g/mL}$).

3.6

copper standard stock solution. Weigh 1.0000g copper (mass fraction $\geq 99.99\%$) in 250mL beaker, add 10mL water, Along Beibi added 10mL of nitric acid (3.5), cover the surface of the pan, over low heat until completely dissolved, boil expelled nitrogen oxides, remove the cooled to room temperature. Moved into 1000mL volumetric flask, dilute with water to volume, and mix. 1mL solution containing 1mg of copper.

3.7

iron standard stock solution. Weigh 1.4297g ferric oxide (excellent pure) in 250mL beaker, add 50mL of hydrochloric acid (3.2), Cover with a watch glass, low heat until completely dissolved, remove the cooling to room temperature. Moved into 1000mL volumetric flask, dilute with water to volume, and mix.

1mL solution containing 1mg iron.

3.8

Calcium standard stock solution. Weigh 2.4973g of calcium carbonate by drying 105 °C ~ 110 °C (reference reagent) in 250mL beaker, Was added 50mL of hydrochloric acid (3.2), covered with a watch glass, low heat until completely dissolved, heating to boil 1min ~ 2min, removed and cooled to room temperature.

Moved into 1000mL volumetric flask, dilute to the mark, mix and store in a plastic bottle. 1mL solution containing 1mg calcium.

3.9

Magnesium standard stock solution. Weigh 1.6583g ignition at 800 °C to constant weight of magnesium oxide (reference reagent) in 250mL beaker, add Into 50mL of hydrochloric acid (3.2), covered with a watch glass, low heat until completely dissolved, remove the cooling to room temperature. Moved into 1000mL volumetric flask, Diluted with water to the mark, mix and store in a plastic bottle. This solution 1mL 1mg containing magnesium.

3.10

copper, iron, calcium and magnesium mixed standard solution. Pipette respectively 25.00mL copper standard stock solution (3.6), storage of iron standard solution Solution (3.7), calcium standard stock solution (3.8) and magnesium standard stock solution (3.9) in 250mL volumetric flask, dilute to the mark with hydrochloric acid (3.4) Degree of mixing, stored in a plastic bottle. This solution 1mL containing 100µg copper, iron, calcium and magnesium.

3.11

argon (volume fraction $\geq 99.99\%$).