

ICS 77.120.99

CCS H 71

YS

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

YS/T 1028.4-2015

**Methods for chemical analysis of lithium iron phosphate. Part 4:
Determination of carbon content. High frequency combustion
with infrared absorption method**

磷酸铁锂化学分析方法 第4部分：碳量的测定 高频燃烧红外吸收法

(English Translation)

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Foreword

YS/T 1028 Methods for chemical analysis of lithium iron phosphate consists of 5 parts.

-- Part 1.Determination of total iron content - Titanium trichloride reduction

potassium dichromate titration methods;

-- Part 2.Determination of lithium content - Flame photometry;

-- Part 3.Determination of phosphor content - Quinoline phosphomolybdate gravimetry;

-- Part 4.Determination of carbon content - High frequency combustion with infrared absorption method;

-- Part 5.Determination of calcium, magnesium, zinc, copper, lead, chromium, sodium, aluminium, nickel, cobalt and manganese content - Inductively coupled plasma atomic emission spectrometry

This part is Part 4 of YS/T 1028.

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

This part was proposed and shall be under the jurisdiction of the National Technical Committee on Nonferrous Metals of Standardization Administration of China (SAC/TC243).

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Methods for chemical analysis of lithium iron phosphate -

Part 4. Determination of carbon content - High frequency combustion with infrared absorption method

1 Scope

This part of YS/T 1028 specifies the method for determining the carbon content in lithium iron phosphate.

This part applies to the determination of carbon content in lithium iron phosphate.

Measuring range. 0.5%~5.0%.

2 Method summary

The sample and flux are put into a porcelain crucible and heated with a high-frequency induction furnace in the oxygen flow. The carbon is burned to generate carbon dioxide, which is carried by the oxygen to the infrared absorption cell. The change of carbon dioxide concentration on infrared absorption energy follows Beer's law. The analysis results of carbon content are directly displayed on the display as a percentage.

3.2 Desiccant. Anhydrous magnesium perchlorate with a particle size of 0.7 mm~1.2

mm.

3.4 Pure iron. The purity is greater than 99.8%, and the carbon content is less than

0.002%.

4 Instruments

The operating parameters of the instruments shall meet the following requirements.

5.1 Before use, the sample shall be dried in an oven at $110\text{ }^{\circ}\text{C}\pm 5\text{ }^{\circ}\text{C}$ for 1 hour, then

taken out and stored in a desiccator.

6 Analysis steps

WARNING -- The hazards associated with combustion analysis are primarily pre-fired porcelain crucibles and combustion during the melting process.

6.1 Specimen

Weigh 0.20 g of specimen, accurate to 0.0001 g.

6.2 Preparation before analysis

Before starting the instrument, use oxygen (3.1) to check the air tightness of the gas path. The combustion chamber and filter shall be cleaned frequently. Regularly replace the desiccant (3.2) and purifying agent (3.3) according to the requirements of the instrument.

6.3 Blank test

Weigh 0.35 g of pure iron (3.4) and 2.0 g of tungsten particles (3.5) and place them in a porcelain crucible (3.6). Measure them in the same range or channel according to 6.5. Repeat the measurement until the reading is stable. Record the smallest, relatively stable and consistent three readings, calculate the average value, and enter it into the instrument. The instrument will automatically deduct the blank value when measuring the specimen.

6.5.1 Add 0.35 g of pure iron (3.4) to the porcelain crucible (3.6), place the crucible on

the electronic balance, and weigh it. Then, add the specimen (6.1) into the porcelain crucible, weigh it, enter the mass of the specimen, and take it down. Add about 2.0 g of

tungsten particles (3.5) to cover the specimen, and move the porcelain crucible to the crucible base.

7.1 Repeatability

The measured values of two independent test results obtained under repeatability conditions are within the average value range given below; the absolute difference between the two test results does not exceed the repeatability limit (r), the probability of exceeding the repeatability limit (r) does not exceed 5%, and the repeatability limit (r) is obtained by linear interpolation according to the data in Table 1.

8 Test report

The test report shall include the following content.

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