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

YS/T 520.4-2007

Replacing YS/T 520.4-2006

**Chemical analysis of gallium. Part 4: Determination of iron
content. The 4, 7-diphenyl-1, 10-phenanthroline
spectrophotometric method**

镓化学分析方法 第4部分：铁含量的测定4,7-二苯基-1,10-二氮杂菲分光光度法
(English Translation)

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Foreword

YS/T 520-2007 "Chemical analysis of gallium" is the YS/T 520-2006 (formerly GB/T 4375-1984) amendments, divided into Part 12.

--- Part 1. Determination of copper content of 2,9-dimethyl-4,7-diphenyl-1,10-phenanthroline spectrophotometry

--- Part 2. Determination of lead content of 4- (2-pyridyl) - resorcinol spectrophotometry

--- Part 3. Determination of aluminum content Chromazurol S- tetradecyl pyridine bromide spectrophotometric method

--- Part 4. Determination of iron content of 4,7-diphenyl-1,10-phenanthroline spectrophotometry

--- Part 5. Determination of calcium content nitrous oxide - acetylene flame atomic absorption spectrometry

--- Part 6. Determination of tin content salicylfluorone - cetyl trimethyl ammonium bromide, spectrophotometry

--- Part 7. Determination of silicon content extraction - molybdenum blue spectrophotometric method

--- Part 8. Determination of indium content of ethyl violet spectrophotometry

--- Part 9. Determination of germanium content Phenylfluorone - polyethylene glycol octyl phenyl ether extraction spectrophotometric method

--- Part 10. Determination of zinc content atomic absorption spectrometry

--- Part 11. Determination of mercury content of the cold atomic absorption spectrometry

--- Part 12. lead, copper, nickel, aluminum, indium and zinc Determination of chemical spectroscopy this is Part 4.

The partial replacement of YS/T 520.4-2006 (formerly GB/T 4375.4-1984).

This part is YS/T 520.4-2006 "Chemical analysis of gallium - Part 4. Determination of iron content of 4,7-diphenyl-1,10 Phenanthroline spectrophotometry "editorial finishing.

The non-ferrous metal part by the National Standardization Technical Committee and centralized.

This standard by the Aluminum Corporation of China Shandong branch responsible for drafting.

Drafters of this section. Yun-Xia Wang, Liu Yulong, Tian Rui, Qi Yanli.

The non-ferrous metal part by the National Standardization Technical Committee responsible for the interpretation.

This part of the standard replaces the previous editions are.

--- YS/T 520.4-2006 (formerly GB/T 4375.4-1984).

Chemical analysis of gallium Part 4. Determination of iron content
4,7-diphenyl-1,10-phenanthroline spectrophotometry

1 Scope

This section provides the determination of gallium in iron content.

This section applies to the determination of iron content in gallium. Measurement range.
0.00005% to 0.015%.

2 Method summary

The sample is dissolved in hydrochloric acid and nitric acid. With hydroxylamine hydrochloride reduced iron (III), sodium citrate masked substrate gallium, at pH = 5 ~ 6 iron conditions (II) with 4,7-diphenyl-1,10-phenanthroline to form a red complex was extracted with iso-amyl alcohol, measured at 530nm wavelength spectrophotometer Absorbance.

3 Reagents

3.1

ethanol, pure class distinctions.

3.2

isoamyl alcohol.

3.3

ammonia, pure class distinctions.

3.4

nitric acid, 120 °C purified by distillation.

3.5

hydrochloric acid, sodium boiling purified by distillation.

3.6 4,7-diphenyl-1,10-phenanthroline ethanol solution (2g/L).

3.7

hydroxylamine hydrochloride solution (200g/L). Weigh 100g of hydroxylamine hydrochloride, 25g of anhydrous sodium acetate, into 800mL beaker, dissolved in water Diluted to 500mL, placed and heated to 80 °C ~ 90 °C water bath, added 10mL 4,7--diphenyl-1,10-phenanthroline solution (3.6) and 10mL absolute ethanol (3.1), stir with a glass rod in the water bath for 20min, removed, placed more than 4h. The solution was transferred to 1000mL separating funnel, add 30mL isoamyl alcohol (3.2), severe shock, standing layered organic phase was discarded. Repeat this procedure until the organic phase was colorless. The aqueous phase was transferred to a polyethylene bottle save.

3.8

sodium citrate solution (300g/L). Weigh 150g sodium citrate, 2g of hydroxylamine hydrochloride, placed in 800mL beaker, dissolved in water diluted Diluted to 500mL, according to the following hydroxylamine hydrochloride solution (3.7) the heat from the water bath to 80 °C ~ 90 °C start. If the iron content Too high, there should be another purification operation.

3.9

thiourea solution (100g/L). Weigh 10g of thiourea in 250mL beaker, dissolved in water and diluted to 100mL, hydroxylamine hydrochloride according to the following Amine solution (3.7) said, from the water bath was heated to 80 °C ~ 90 °C start [4,7-diphenyl-1,10-phenanthroline solution (3.6) and Iso-amyl alcohol (3.2) used were changed to 5mL and 15mL].

3.10

iron standard stock solution. Weigh 1.0000g iron [(Fe) >=99.99%], placed in 400mL beaker, add 30mL nitrate Acid (1 + 1), and dissolved by heating to remove nitrogen oxides, cooled and transferred to 1000mL volumetric flask, dilute with water to volume, and mix. this Solution 1mL containing 1.0mg iron.

3.11

Iron standard solution. Pipette 10.00mL iron standard stock solution (3.10), placed in 100mL volumetric flask, dilute to the mark, Mix well. This solution 1mL containing 100µg iron.

3.12

Iron standard solution. Pipette 10.00mL iron standard solution (3.11), placed in 100mL volumetric flask, dilute with water to volume, and mix.

This solution 1mL containing 10 μ g iron.

3.13

Iron standard solution. Pipette 10.00mL iron standard solution (3.12), placed in 100mL volumetric flask, dilute with water to volume, and mix.