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

YS/T 520.12-2007

Replacing YS/T 520.12-2006

**Chemical analysis of gallium. Part 12: Determination of lead,
copper, nickel, aluminum, indium and zinc content. The
spectrochemical method**

镓化学分析方法 第12部分：铅、铜、镍、铝、铟、锌含量的测定化学光谱法
(English Translation)

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3.1 Hydrochloric acid ($\rho=1.19\text{g/cm}^3$)

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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 12.

The partial replacement of YS/T 520.12-2006 (formerly GB/T 4375.12-1984).

This part is the determination of YS/T 520.12-2006 "Chemical analysis of gallium Part 12 lead, copper, nickel, aluminum, indium and zinc content Chemical spectroscopy" 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.

This section drafters. Zhang Xinyu, Zhongxiu Xia.

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 520.12-2006 (formerly GB/T 4375.12-1984).

Chemical analysis of gallium Part 12. lead, copper, nickel, aluminum, indium, zinc
Determination of chemical spectroscopy

1 Scope

This section provides lead, copper, nickel, aluminum, indium, gallium determination of zinc content in.

This section applies to gallium [(Ga) $\geq 99.999\%$] of lead, copper, nickel, aluminum, indium, zinc content simultaneously. Determination of the range in Table 1.

Table 1

Measuring element	Measuring range /%
Lead	$5 \times 10^{-5} \sim 3 \times 10^{-4}$
Copper	$5 \times 10^{-5} \sim 3 \times 10^{-4}$
Nickel	$5 \times 10^{-6} \sim 5 \times 10^{-5}$
Aluminum	$5 \times 10^{-6} \sim 5 \times 10^{-5}$
Indium	$1 \times 10^{-5} \sim 1 \times 10^{-4}$
Zinc	$1 \times 10^{-5} \sim 1 \times 10^{-4}$

2 Method summary

Sample in hydrochloric acid and nitric acid to dissolve. In 7.5mol/L HCl medium, isopropyl ether extraction separation body gallium enrichment in the aqueous phase Miscellaneous Quality (lead, copper, nickel, aluminum, indium, zinc) to the solution of the residue method, using spark excitation light source or AC arc light source, spectral measurement.

3.1 Hydrochloric acid (rho1.19g/cm

3). After quartz distiller purified by distillation at 95 °C calibration concentration.

3.2 hydrochloric acid (7.5mol/L). formulated with hydrochloric acid (3.1).

3.3 hydrochloric acid (6mol/L). formulated with hydrochloric acid (3.1).

3.4 Nitrate (rho1.42g/cm

3). The quartz distiller 120 °C purified by distillation.

3.5 nitric acid (1 + 1). formulated with nitric acid (3.4).

3.6 isopropyl ether. in a separatory funnel first with hydroxylamine hydrochloride solution (100g/L) or ferrous ammonium sulfate solution (200g/L) was removed by washing with shaking peroxide Thereof, then transferred to a distillation flask in a water bath at 80 °C purified by distillation, collecting 67 °C ~ 69 °C distillate. Before use hydrochloric acid (3.2) saturated.

3.7 Deionized water. conductivity greater than 10S/m.

3.8 polystyrene benzene solution (1.5%).

3.9 lead standard stock solution. Weigh 1.0000g spectra of pure lead [(Pb) >=99.99%], placed in 300mL beaker, add 10mL Nitric acid (3.5), after the dissolution of the low temperature, the solution was evaporated to a low volume, cooling is removed and transferred to 1000mL volumetric flask, 100mL of hydrochloric acid was added (3.1), water (3.7) diluted to the mark, and mix. This solution 1mL containing 1.0mg lead.

3.10 Copper Standard stock solution. Weigh 1.0000g copper spectrum [(Cu) >=99.99%], placed in 300mL beaker, add 10mL Nitric acid (3.5), after the dissolution of the low temperature, the solution was evaporated to a low volume, cooling is removed and transferred to 1000mL volumetric flask, 100mL of hydrochloric acid was added (3.1), water (3.7) diluted to the mark, and mix. This solution 1mL containing 1.0mg of copper.

3.11 Nickel standard stock solution. Weigh 1.0000g spectrum pure nickel [(Ni) >=99.99%], placed in 300mL beaker, add 10mL Nitric acid (3.5), after the dissolution of the low temperature, the solution was evaporated to a low volume, cooling is removed and transferred to 1000mL volumetric flask, 100mL of hydrochloric acid was added