

ICS 77.040.30  
CCS H 17

**YS**

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

**YS/T 34.1-2011**

Replacing YS/T 34.1-1992; YS/T 34.2-1992

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**Method for chemical analysis of the high-purity arsenic. Inductive  
coupling plasma mass spectrum(ICP-MS) for determinating the  
concentration of elements in the high-purity arsenic**

高纯砷化学分析方法电感耦合等离子体质谱法(ICP-MS)测定高纯砷中杂质含量  
**(English Translation)**

**Issued on: December 20, 2011**

**Implemented on: July 1, 2012**

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**Issued by: Ministry of Industry and Information Technology**

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### Foreword

YS/T 34 "high-purity arsenic chemical analysis method" consists of three parts.

--- Part 1. Methods for chemical analysis of high-purity arsenic by inductively coupled plasma mass spectrometry (ICP-MS) Determination of impurities in high-purity arsenic content;

--- Part 2. Determination of the amount of high-purity arsenic and selenium chemical analysis of polarography;

--- Part 3. Determination of the amount of high-purity arsenic and sulfur chemical analysis of polarography.

This section is YS/T Part 1 34.

The partial replacement of YS/T 34.1-1992 "Methods for chemical analysis of high purity arsenic malachite green spectrophotometric determination of antimony content" and YS/T 34.2-1992 "Methods for chemical analysis of high-purity arsenic chemistry spectrometry determination of cobalt, zinc, silver, copper, calcium, aluminum, nickel, chromium, lead, magnesium, iron." this section compared with YS/T 34.1 ~ 34.2-1992 standard, there are the following changes.

Determination of arsenic in high purity magnesium, chromium, nickel, copper, zinc, silver, lead, bismuth, sodium, potassium, aluminum, calcium, iron, antimony --- using inductively coupled plasma mass spectrometry, etc.

Content of 14 impurities.

--- According to GB/T 1.1-2009. the preparation of "Standardization Guide Part 1 standard structure and writing" requirement.

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

This section is responsible for drafting unit. Emei Semiconductor Material Factory, Emeishan Jia Mei High Purity Materials Co., Ltd.

## 1 Scope

YS/T of the provisions of section 34 of the method for the determination of arsenic in high purity metallic impurities, using inductively coupled plasma mass spectrometry determination of arsenic Magnesium, chromium, nickel, copper, zinc, silver, antimony, lead, bismuth, sodium, potassium, aluminum, calcium, iron and other impurities 14.

This section applies to the determination of 99.99999% ~ 99.999% high-purity arsenic content of metal impurities. Determination range of  $1 \times 10^{-7}\%$  ~  $1000 \times 10^{-7}\%$ .

## 2 Method summary

Under the conditions of  $120\text{ }^{\circ}\text{C}$  ~  $130\text{ }^{\circ}\text{C}$ , the sample with hydrogen chloride - chlorine gas mixture reacts and impurity elements arsenic trichloride chloride, low After boiling volatile with arsenic trichloride gas flow, dissolved in nitric acid chloride impurities left behind. Recommended use beryllium, indium, uranium as an internal standard, routine Determination of plasma - mass spectrometry magnesium, chromium, nickel, copper, zinc, silver, antimony, lead, bismuth, the determination of sodium, potassium, aluminum, calcium, iron with cold plasma mass spectrometry.

### 3.1 Reagents

#### 3.1.1

hydrochloric acid (rho1.19). After the RM-B or BV-III, sub-boiling distillation of use.

#### 3.1.2

nitrate (rho1.42). RM-B or BV-III, after sub-boiling distillation of use.

#### 3.1.3

sulfuric acid (rho1.84). pure class distinctions.

#### 3.1.4

Hydrogen peroxide (30%). AR.

#### 3.1.5

deionized water. resistivity  $\geq 18\text{Mohm} \cdot \text{cm}$ .

#### 3.1.6

Argon  $\geq 99.99\%$ .

### 3.2.1 Element stock standard solution

Standard stock solution used as a national standard. Uranium concentration was 500 $\mu$ g/mL, the remaining elements are 1000 $\mu$ g/mL.

### 3.2.2 Internal standard solution

No. 1 internal standard solution (500ng per ml beryllium, 500ng indium, 500ng uranium). Beryllium standard solution Pipette 0.5mL, 0.5mL indium standard Standard solution, 1.0mL uranium standard solution, placed in 1L polypropylene flask, add 20mL of nitric acid, the volume, and mix.

2 internal standard solution (10ng per ml beryllium, indium 10ng, 10ng uranium). Pipette No. 20mL1 internal standard solution, placed in 1L polypropylene Flask, add 20mL of nitric acid, the volume, and mix.