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

YS/T 746.7-2010

**Methods for chemical analysis of lead-free tin-based solders.
Part 7: Determination of iron content. Flame atomic absorption
spectrometric method**

无铅锡基焊料化学分析方法 第7部分：铁含量的测定 火焰原子吸收光谱法
(English Translation)

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Foreword

YS/T 746 "lead-free solder based on the chemical analysis method" is divided into 17 parts.

Determination of tin content - Part 1. Determination of tin content - Coking of gallic acid - Titanium nitrate titration - Part 2 Determination of silver content Flame atomic absorption spectrometry and potassium thiocyanate potentiometric titration Part 3. Determination of copper content - Flame atomic absorption spectrometric method and sodium thiosulfate titration method Part 4. Determination of Lead Content - Flame Atomic Absorption Spectrometry Part 5 Determination of bismuth content - Flame atomic absorption spectrometric method and Na₂EDTA titration method Part 6. Determination of antimony content - Flame atomic absorption spectrometric method Part 7. Determination of iron content - Flame atomic absorption spectrometric method Part 8 - Determination of arsenic content - Arsenic, antimony, molybdenum blue spectrophotometric method Part 9. Determination of zinc content - Flame atomic absorption spectrometric method and Na₂EDTA titration method Part 10. Determination of aluminum content - Electrothermal atomic absorption spectrometric method Part 11. Determination of cadmium content - Flame atomic absorption spectrometric method Part 12. Determination of indium content - Na₂EDTA titration method Part 13. Determination of nickel content - Flame atomic absorption spectrometric method - Part 14 - Determination of phosphorus content - Crystalline violet - phosphorous vanadium molybdenum heteropoly acid spectrophotometric method Part 15. Determination of germanium content - Salicyl - based fluorone spectrophotometric method - Part 16 - Determination of rare earth content - Arsenazo III spectrophotometric method Determination of silver, copper, lead, bismuth, antimony, iron, arsenic, zinc, aluminum, cadmium, nickel and indium Inductively coupled plasma emission Spectrum method this section is part 7.

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

This part is the national nonferrous Metals Standardization Technical Committee (SAC/TC243).

This part of the drafting unit. Guangxi Huaxi Group Co., Ltd.

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1 Scope

YS/T 746 This section specifies the determination of iron content in lead-free solder.

This part is applicable to the determination of iron content in lead-free solder. Measurement range. 0.0010% ~ 0.150%.

2 Method summary

The sample was mixed with acid-dissolving material, washed with hydrochloric acid-hydrobromide tin, antimony, in hydrochloric acid medium at an atomic absorption spectrometer wavelength of 248.3 nm , With flame atomizer, air - acetylene flame, measure the absorbance of iron.

3 Reagent

Unless otherwise stated, only the reagents identified as analytical reagents and distilled or deionized water or comparable purity were used in the analysis.

3.1

hydrochloric acid (ρ 1.19g/mL), excellent grade pure.

3.2

Hydrochloric acid (1 1).

3.3

nitric acid (ρ 1.42g/mL).

3.4

Mixed acid. 30 mL nitric acid, 70 mL hydrochloric acid and 100 mL water.

3.5

Hydrogen peroxide (30%).

3.6

hydrobromic acid (ρ 1.49g/mL).

3.7

Hydrochloric acid - hydrobromic acid (1 1).

3.8

Thiourea solution (50 g/L).

3.9

iron standard solution. Weigh 0.1000g metallic iron ($\geq 99.99\%$), placed in 250mL beaker, add 20mL hydrochloric acid (3.2), 3 drops of hydrogen peroxide (3.5), slightly heat dissolved completely, remove the cooling to room temperature, into the 1000mL volumetric flask, diluted with water to the mark, mix.

1 mL of this solution contains 100 μg of iron.

4 Instruments

Atomic absorption spectrometer, with iron hollow cathode lamp.

In the best working conditions of the instrument, who can meet the following indicators can be used.

--- Characteristic concentration. In the solution consistent with the substrate of the measurement solution, the characteristic concentration of iron should not be more than 0.033 $\mu\text{g/mL}$;

Precision. the maximum concentration of the standard solution measured 10 times the absorbance, the standard deviation should not exceed 1.0% of the average absorbance;

The standard deviation should not exceed the maximum of 10 absorbance measured with the lowest concentration of the standard solution (not the "zero" concentration standard solution) Concentration Standard solution 0.5% of the average absorbance;

--- working curve linear. the working curve by the concentration of divided into five sections, the highest section of the difference between the absorbance difference and the lowest of the difference in absorbance Ratio, should not be less than 0.7.