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YS

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

YS/T 746.15-2010

**Methods for chemical analysis of lead-free tin-based solders.
Part 15: Determination of Germanium content. Salicylrone-sim
polyethylene glycol phenyl ether spectrophotometry**

无铅锡基焊料化学分析方法 第15部分：锗含量的测定 水杨基荧光酮分光光度法
(English Translation)

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Foreword

YS/T 746 "non-Pb-based solder chemical analysis method" is divided into 17 parts.

--- Part 1 Determination of tin content Coke sexual gallic acid Covering - lead nitrate titration method

--- Part 2 of silver content - Flame atomic absorption spectrometry and potentiometric titration with potassium thiocyanate

--- Part 3 of copper content - Flame atomic absorption spectrometry and titration with sodium thiosulfate

--- Part 4 of lead content - Flame Atomic Absorption Spectrometry

--- Part 5 of bismuth content - Flame atomic absorption spectrometry and titration Na₂EDTA

--- Part 6 of antimony content - Flame Atomic Absorption Spectrometry

--- Part 7 Determination of iron content by flame atomic absorption spectrometry

--- Part 8 of arsenic content of arsenic, antimony molybdenum blue spectrophotometric method

--- Part 9 Determination of zinc content by flame atomic absorption spectrometry and titration Na₂EDTA Part 10 Determination of aluminum content --- first electrothermal atomic absorption spectrometry

--- Part 11 of cadmium content - Flame Atomic Absorption Spectrometry

--- Part 12 Determination of indium titration Na₂EDTA

--- Part 13 Determination of nickel content by flame atomic absorption spectrometry

--- Part 14 Determination of the phosphorus content of the first crystal violet - heteropoly

acid phosphovanadomolybdate spectrophotometry

--- Part 15 Determination of germanium content salicylfluorone spectrophotometry

--- Part 16 Determination of rare earth Arsenazo III spectrophotometry

--- Part 17 silver, copper, lead, bismuth, antimony, iron, arsenic, zinc, aluminum, cadmium, nickel, indium content was measured by inductively coupled plasma optical emission Spectroscopy this is Part 15.

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

The non-ferrous metal part by the National Standardization Technical Committee (SAC/TC243) centralized.

This section is drafted. Yunnan Tin Group Co., Ltd.

Participated in the drafting of this section. Yunnan Tin Company Limited, your research Platinum Limited.

1 Scope

YS/T 746 This section specifies the determination method based solder lead-free solder in the germanium content.

This section applies to the determination of tin-based solder without germanium content. Measurement range. 0.0010% to 0.050%.

2 Method summary

Sample with nitric acid, sulfuric acid, phosphoric acid dissolved in the presence of hydrochloric acid distillation main base, in the presence of OP, Ge4 and salicylfluorone Ketone form a red complex, in the spectrophotometer at a wavelength of 505nm, measured absorbance.

3 Reagents

Unless otherwise indicated in the analysis using only recognized as analytical grade reagents and distilled or deionized water or equivalent purity.

3.1

hydrochloride (ρ 1.19g/mL).

3.2

sulfate (ρ 1.84g/mL).

3.3

phosphoric acid (ρ 1.69g/mL).

3.4

hydrochloride (11).

3.5

nitric acid (11).

3.6

potassium permanganate solution (20g/L). Store in a brown bottle aside.

3.7

ascorbic acid solution (50g/L). The time is now equipped with.

3.8 Salicylfluorone (SAF) solution (0.1g/L). Weigh 0.05g salicylfluorone in 500mL beaker, 250mL

Ethanol, and dissolved with stirring, was added 5mL of sulfuric acid (12) diluted with water to a 500 mL, mix.

3.9 polyethylene glycol octyl phenyl ether (OP) solution (2%). Pipette 6mL polyethylene glycol octylphenyl ether, diluted with water to 300mL, Mix well.

3.10 germanium standard stock solution. Weigh 0.1000g germanium ($\geq 99.99\%$) in 250mL beaker, add 5mL of hydrogen peroxide (30%), Low dissolved by heating, was added dropwise aqueous ammonia (ρ 0.90g/mL) until a white precipitate was dissolved with sulfuric acid (14) was neutralized and the excess 0.5mL, moved 1000mL volumetric flask, dilute with water to volume, and mix. This solution 1mL containing 100 μ g germanium.

3.11 Germanium standard solution. Pipette 10.00mL germanium standard stock solution (3.10) in 500mL volumetric flask, dilute to the mark with water, mix uniform. This solution 1mL containing 2 μ g germanium.

4 Distillation apparatus

Distillation apparatus shown in Fig.