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

YS/T 746.14-2010

**Methods for chemical analysis of lead-free tin-based solders. Part 14:
Determination of phosphorus content. Crystal violet
phosphorus-vanadium-molybdenum heteropoly acid spectrophotometry**

无铅锡基焊料化学分析方法 第14部分：磷含量的测定 结晶紫-磷钒钼杂多酸分光
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 section is in accordance with GB/T 1.1-2009 given rules drafted.

This is Part 14.

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 Corporation, your research Platinum Limited.

1 Scope

YS/T 746 This section provides lead-free tin-based solders Determination of phosphorus content.

This section applies to the determination of lead-free tin-based solders phosphorus content. Measurement range. 0.0010% to 0.100%.

2 Method summary

Sample with nitric acid, hydrochloric acid dissolved in the presence of sulfuric acid, with hydrochloric acid - hydrobromide exclude volatile tin, arsenic, antimony; in 0.24mol/L sulfuric acid solution , The phosphorus and ammonium molybdate, ammonium metavanadate formed phosphovanadomolybdate heteropoly acid; polyvinyl alcohol in the presence of crystal violet and phosphorus vanadium molybdenum heteropoly acids with purple Was measured absorbance at 545nm wavelength spectrophotometer.

3 Reagents

Unless otherwise indicated, used in the analysis confirmed only for the gifted class pure reagents and a water.

3.1

hydrochloride (rho1.19g/mL).

3.2

sulfate (rho1.84g/mL).

3.3

hydrobromide (rho1.38g/mL).

3.4

Ammonia (rho0.90g/mL).

HCl 3.5 - hydrobromic acid (11).

3.6

sulfate (11).

3.7

sulfate (18).

3.8

nitric acid (12).

3.9

metavanadate solution (2g/L).

3.10

ammonium molybdate solution (40g/L).

3.11

Mo - V mixture. ammonium molybdate solution with 7mL to 13mL ammonium metavanadate solution mixing diluted with water to 500mL, and mix. Savings Stored in plastic bottles for use.

3.12

solution of polyvinyl alcohol (PVA-124) (5g/L), AR.

3.13

crystal violet solution (0.5g/L).

3.14

P standard stock solution. Weigh 0.4394g potassium dihydrogen phosphate (reference reagent or pure class distinctions, previously dried at 105 °C to constant weight), set in 250mL beaker, dissolved in water and transferred to 1000mL volumetric flask, dilute with water to volume, and mix. This solution containing 1mL 100µg phosphorus.

3.15

Phosphorus standard solution. Pipette 10.00mL phosphorus standard stock solution (3.14) in 500mL volumetric flask, dilute to the mark with water, mix uniform. This solution 1mL containing 2µg phosphorus.

3.16

pairs nitrophenol solution (1g/L), AR.