ICS 77.120.20
CCS H12

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 20975.26-2013

Methods for chemical analysis of aluminium and aluminium alloys - Part 26: Determination of carbon content - Infrared absorption method

铝及铝合金化学分析方法 第26部分：碳含量的测定 红外吸收法

Issued on: November 27, 2013 **Implemented on: August 1, 2014**

Issued by: AQSIQ; SAC

Table of Contents

Foreword

GB/T 20975 "Methods for chemical analysis of aluminum and aluminum alloys" is divided into 26 parts.

--- Part 1. Determination of mercury content - Cold atomic absorption spectrometry;

--- Part 2. Determination of arsenic content - Molybdenum blue spectrophotometric method;

--- Part 3. Determination of copper content;

--- Part 4. Determination of iron content phenanthroline spectrophotometry;

--- Part 5. Determination of silicon content;

--- Part 6. Determination of cadmium content by flame atomic absorption spectrometry;

--- Part 7. Determination of manganese content - Potassium periodate spectrophotometric method;

--- Part 8. Determination of zinc content;

--- Part 9. Determination of lithium content Flame atomic absorption spectrometry;

--- Part 10. Determination of tin content;

--- Part 11. Determination of lead content by flame atomic absorption spectrometry;

--- Part 12. Determination of titanium content;

--- Part 13. Determination of vanadium content of benzoyl phenylhydroxylamine spectrophotometry;

1 Scope

Part 26 of China's long series of chemical analysis methods for aluminium and aluminium alloys, covering the determination of carbon by infrared absorption. Carbon is present in aluminium at trace levels, largely as carbide picked up from the carbon anodes and linings

of the reduction cell and from the melt handling that follows, and it matters because carbide particles are hard, insoluble inclusions: they show up as defects in foil and in thin strip, they mark the surface of an anodised part, and they blunt the tools that machine the metal. This part specifies the determination of the carbon content of aluminium and aluminium alloys by the infrared absorption method. The sample is burned in a stream of oxygen in a high frequency induction furnace, with an accelerator added so that the aluminium, which does not burn readily on its own, is brought to a temperature at which every form of carbon present is converted to carbon dioxide; the combustion gas is then swept through an infrared cell, and the carbon dioxide is measured from the absorption at its characteristic wavelength and integrated over the burn. Because the analyte is at trace level and carbon is everywhere, the standard is largely about the blank: the preparation and cleaning of the crucible, the purity of the oxygen and of the accelerator, the conditioning of the furnace, and the calibration against certified reference materials of matching composition. Issued on 27 November 2013 and in force since 1 August 2014.

This section provides the determination of aluminum and aluminum carbon content. This section applies to the determination of aluminum and aluminum alloy with carbon content, measurement range. 0.010% to 1.00%.

2 Method summary

Sample was placed in a high-frequency burner, OXYGEN high frequency induction heating burner. Wherein the carbon is oxidized to carbon dioxide by excess Loading infrared gas analyzer oxygen measuring cell. Characterized in that the carbon dioxide has a strong absorption band at 4.262μm, this absorbed energy as their concentration Proportional to the degree, according to the detector detects changes in the carbon content of the received energy.

3 Reagents and materials

3.1 magnesium perchlorate. anhydrous, granular.

3.2 Alkali Asbestos. granular.

3.4 Tungsten metal particle. w (C) <=0.0008%, w (S) <=0.0005%, particle size of 0.4mm ~ 0.8mm.

3.5 metallic tin particles. w (C) <=0.0008%, w (S) <=0.0005%, particle size of 0.8mm ~ 1.0mm.

3.6 Nickel scrap. the purity is greater than 99.8%, w (C) <=0.0005%, w (S) <=0.0005%, particle size of 0.8mm ~ 1.68mm.

3.7 Oxygen. purity of more than 99.95%.

3.8 Power gas source. compressed air or nitrogen, the impurity (water and oil) is less than

0.5%.

3.9 porcelain crucible. 25mm x 25mm, and above 1200 °C heat 4h or burning in oxygen burning to blank the lowest value.

3.10 certified national standards for sample (sample carbon content and adapt). Calcium carbonate

3.11 benchmark. at 105 °C drying 2h, placed in the dryer to cool and set aside.

4 Instruments and equipment

4.1 Carbon and sulfur analyzer. a high-frequency induction furnace, the melting temperature of the sample should meet the requirements.

4.2 Analytical balance. accurate to 0.0001g.

5 Sample

The sample was processed into a thickness of less than 0.1mm debris.