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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 23273.1-2009

**Methods for chemical analysis of cobalt oxalate - Part 1:
Determination of cobalt content - Potentiometric titration
method**

草酸钴化学分析方法 第1部分：钴量的测定 电位滴定法

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Foreword

GB/T 23273 "Methods for chemical analysis of cobalt oxalate" a total of eight sections.

- Part 1. Determination of cobalt content by potentiometric titration
 - Part 2. Determination of lead content of electrothermal atomic absorption spectrometry
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 - Part 7. Determination of sulfate ion content of combustion - iodometric method
 - Part 8. nickel, copper, iron, zinc, aluminum, manganese, lead, arsenic, calcium, magnesium, sodium content - Inductively coupled plasma atomic emission spectrometry
- This is Part 1. This part is proposed by the China Nonferrous Metals Industry Association. The non-ferrous metal part by the National Standardization Technical Committee. This section is responsible for drafting Jinchuan Group Limited. This in part by the Beijing General Research Institute of Mining and Metallurgy, Ganzhou cobalt tungsten Ltd. participated in the drafting. The main drafters of this section. Zhang Zhi hair, dry Yong, Yu Shengjie, Qin Xia, Lvqing Cheng, Lin Hsiu-ying, in force, Tangshu Fang, Wan Jianhong, Li Neng Hua, Xiu Xiang. Methods for chemical analysis of cobalt oxalate Part 1. Determination of cobalt content by potentiometric titration

1 Scope

GB/T 23273.1-2009 is the Chinese national standard on methods for chemical analysis of cobalt oxalate - part 1: determination of cobalt content - potentiometric titration method, in the field of metallurgy. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer

specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 5 January 2009 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 November 2009. Classification: ICS 77.120.70, CCS H13. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

--- titration factor ferricyanide standard solution volume consumed per unit volume of the number of standard titration solution of cobalt; V_0

--- Pipette cobalt standard solution volume in milliliters (mL of); $V_p 1$

--- back titration volume cobalt standard solution consumed in milliliters (mL); $V_p 2$

--- standard solution of potassium ferricyanide was added volume in milliliters (mL). Taking an average of three calibration results. Titration volume 0.05mL poor within the scope of the mean value, or re-calibration.

2 Method summary

Sample decomposition with dilute nitric acid, ammonium citrate in the solution, the potassium ferricyanide solution of cobalt (II) oxidation of cobalt (III), the excess iron cyanide Potentiometric titration method using potassium back titration with cobalt standard titration solution.

3 Reagents

Unless otherwise specified, the reagents were analytical reagent, which is a distilled water or equivalent purity water. Nitrate 3.1 ($\rho=1.42\text{g/mL}$).

3.2 nitric acid (1 + 1).

3.3 mixing ammonia ammonium citrate solution. Weigh 60g of ammonium chloride, 120g of ammonium citrate dissolved in 500mL water, add ammonia ($\rho=0.90\text{g/mL}$) To 1000mL, and mix.

3.4 cobalt standard titration solution. Accurately weigh 2.0000g metal cobalt (Co mass fraction $\geq 99.98\%$), was added 20mL of nitric acid (3.2), Low heat until completely dissolved, oxides of nitrogen purge boiling, remove the cooling to room temperature, rinsed with water and dish table cup wall, moved 1000mL capacity Bottle of water volume. 1mL solution containing 2mg cobalt.

3.5 ferricyanide standard solution ($\rho [K_3Fe(CN)_6] = 20\text{g/L}$).

3.5.1 preparation. Weigh 20g of potassium ferricyanide, adding about 250mL dissolved in

water, filtered and diluted with water to 1000mL, shake, stored in brown Color bottle and set aside.

3.5.2 Calibration. Pipette 15.00mL Cobalt Standard Solution (3.4) (V₀), in 150mL beaker, add 50mL ammonium citrate ammonia Mixing solution (3.3), was added 15.00mL ferricyanide accurate standard solution (3.5.1) (V_p 2), in the automatic potentiometric titrator on (4.1), insert The electrode (4.2), stirring, by the end of the potential of the instrument to set the end point of the titration recognition program or set, cobalt standard titration solution (3.4) Titration to the end point potential (V_p 1). According to equation (1) calculate the standard solution of potassium ferricyanide cobalt standard solution titration titration factor. $K = V_p / V_0$

4 Instrument

4.1 automatic potentiometric titrator, with a stirring device.