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GB/T 43753.4-2024

Methods for chemical analysis of precious metals alloys electroplating wastewater - Part 4: Determination of chlorine ion - Silver chloride turbidimetric method

贵金属合金电镀废水化学分析方法 第4部分：氯离子含量的测定 氯化银浊度法

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1.Structure and drafting rules for standardization documents" Drafting. This document is part 4 of GB/T 43753 Chemical analysis methods for precious metal alloy electroplating wastewater. GB/T 43753 has been published The following parts.

1.Determination of gold, silver, platinum, palladium and iridium content by inductively coupled plasma atomic emission spectrometry;

2.Determination of zinc, manganese, chromium, cadmium, lead, iron, aluminium, nickel, copper and beryllium content by inductively coupled plasma atomic emission spectrometry Spectrum;

3.Determination of sulfate content - Barium sulfate gravimetric method;

4.Determination of chloride ion content-Silver chloride turbidimetric method. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by China Nonferrous Metals Industry Association. This document is under the jurisdiction of the National Technical Committee on Standardization of Nonferrous Metals (SAC/TC243). This document was drafted by: Shandong Chenyuan Testing Services Co., Ltd., Shandong Mengjinyuan Jewelry Co., Ltd., Zijin Mining Group Co., Ltd. Co., Ltd., China Certification & Inspection Group Guangxi Co., Ltd., Shenzhen Zhongjin Lingnan Nonferrous Metals Co., Ltd., Nonferrous Metals Technology Economic Research Institute Co., Ltd., Jinchuan Group Co., Ltd., Henan Yuguang Gold and Lead Co., Ltd., University of Science and Technology Beijing, Shandong Zhaojin Gold and Silver Refining Co., Ltd., Zhongbao Zhengxin Gold and Silver Jewelry Testing Co., Ltd., Henan Provincial Geological Bureau Geological Disaster Prevention and Control Center, Jiangxi Provincial Xingui Metals Technology Materials Co., Ltd., Jiangsu Beikuang Metal Recycling Technology Co., Ltd., Dalian Dante Biotechnology Co., Ltd., Zijin Copper Co., Ltd., Guohe General (Qingdao)

Testing and Evaluation Co., Ltd., Guobiao (Beijing) Inspection and Certification Co., Ltd., Tongling Nonferrous Metals Group Holding Co., Ltd., Shandong Hengbang Smelting Co., Ltd., Beikuang Testing Technology Co., Ltd., Guangdong Academy of Sciences Industrial Analysis and Testing Center, Daye Nonferrous Design and Research Institute Co., Ltd., Shanghai Nonferrous Metals Industry Technology Monitoring Center Co., Ltd., Dalian Rongke Energy Storage Group Co., Ltd. Co., Ltd. and Hunan Kaidi Zhongneng Technology Co., Ltd. The main drafters of this document are. Sun Fang, Shao Wenying, Liu Zhenjiang, Feng Hulin, Lai Qiuxiang, Ye Lingling, Li Zhipeng, Zuo Hongyi, Xu Ming, Xiang Lei, Guo Jing, Ma Jinmei, Li Jie, Zhang Shengen, Zhuang Yukai, Feng Guikun, Wang Chunqing, Zhang Chenzi, Yu Fengshan, Chen Neng, Cui Xiangguang, Huang Yanjie, Liao Binling, Luo Xiaobing, Xue Tingting, Gu Xusheng, Chen Caixia, Cheng Xiaoying, Ye Xin, Chang Qingrui, Zhou Hang, Tang Qing, Qiu Qiuyu, Xiao Zehong, Zeng Jing, Shao Wenli, Di Weili and Liu Miaohua.

Precious metal alloy electroplating and electroforming processing enterprises generate a large amount of wastewater during the production process, such as plated parts rinsing water, waste tank liquid, equipment cooling water, etc. Mixed water such as water, flushing water, and surface water contains a large amount of chloride ions that have an impact on wastewater treatment processes and the environment. There is an urgent need for efficient analytical methods to guide the technical solutions for precious metal alloy electroplating and electroforming wastewater treatment and the operation of water treatment processes. GB/T 43753 "Chemical Analysis Methods for Precious Metal Alloy Electroplating Wastewater" is intended to consist of four parts.

1.Determination of gold, silver, platinum, palladium and iridium content by inductively coupled plasma atomic emission spectrometry. The purpose is to establish Detection method for the content of precious metals such as gold, silver, platinum, palladium and iridium in precious metal alloy electroplating and electroforming wastewater.

2.Determination of zinc, manganese, chromium, cadmium, lead, iron, aluminium, nickel, copper and beryllium content - Inductively coupled plasma atomic emission spectrometry The purpose is to establish the technical solution for the treatment of precious metal electroplating and electroforming wastewater, the water treatment operation process and the water quality monitoring of zinc, manganese, Detection methods for chromium, cadmium, lead, iron, aluminum, nickel, copper and beryllium content.

3.Determination of sulfate content by barium sulfate gravimetric method. The purpose is to establish the content of sulfuric acid in precious metal electroplating and electroforming wastewater Method for detecting salt content.

4.Determination of chloride ion content Silver chloride turbidimetric method. The purpose is to establish the determination of chloride ion content in precious metal electroplating and electroforming wastewater. Method for detecting the content of ions. This document is part 4 of GB/T 43753.It uses chlorine and silver nitrate to form silver chloride emulsion in ethanol

medium. The absorbance is measured by a spectrophotometer at a wavelength of 420nm to calculate the mass concentration of chloride ions in the precious metal alloy electroplating and electroforming wastewater. It can meet the testing needs of precious metal electroplating and electroforming wastewater treatment technology solutions, water treatment process operation, etc., and accurately, directly and effectively detect precious metals. Chloride ion content in metal alloy electroplating and electroforming wastewater. Chemical Analysis Methods for Precious Metal Alloy Electroplating Wastewater Part

4.Determination of chloride ion content Silver chloride turbidimetry WARNING. Personnel using this document are required to have practical experience in formal laboratory work. This document does not address all possible safety issues. The user is responsible for taking appropriate safety and health measures and ensuring compliance with the conditions stipulated by relevant national laws and regulations.

1 Scope

GB/T 43753.4-2024 gives the silver chloride turbidimetric method for determining chloride in precious metal electroplating wastewater. Chloride matters in this stream for a reason particular to precious metal recovery: it complexes and precipitates silver, so its concentration governs both how the recovery process behaves and how much metal is lost, and it also determines whether the treated effluent can be reused or discharged. The turbidimetric method is chosen because it is cheap, quick and needs no chromatograph, which suits a works laboratory. The standard sets the principle, the formation of a silver chloride suspension whose turbidity is proportional to the chloride present, the reagents and apparatus, the sample collection, preservation and pretreatment to remove the interferences that a plating bath residue carries, the development of the suspension under controlled conditions, the measurement, the calibration, the calculation, the precision established by interlaboratory trial and the test report. It took effect on 1 October 2024.

This document describes the method for the determination of chloride ion content in precious metal alloy electroplating and electroforming wastewater using the silver chloride turbidimetric method. This document is applicable to the determination of chloride ion content in precious metal alloy electroplating and electroforming wastewater. Determination range. Chloride ion mass concentration 1.0g/L~50.0g/L.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 6682 Specifications and test methods for water used in analytical laboratories

3 Terms and definitions

There are no terms or definitions that require definition in this document.

4 Principle

Chloride ion solution in ethanol medium, chlorine and silver nitrate form silver chloride emulsion, which is measured by spectrophotometer at a wavelength of 420nm. The absorbance was used to calculate the mass concentration of chloride ions.

5 Reagents and Materials

Unless otherwise stated, only reagents of confirmed analytical grade were used in the analyses.

5.1 Water, GB/T 6682, Grade 2.

5.2 Anhydrous ethanol.

5.3 Nitric acid (rho=1.42g/mL).

5.4 Nitric acid (1 2).

5.5 Sodium sulfite solution (100 g/L). Accurately weigh 100 g of sodium sulfite and dissolve it in water (5.1). Transfer it into a 1000 mL volumetric flask and (5.1) Dilute to volume and mix well.

5.6 Silver nitrate solution (10 g/L). Accurately weigh 10 g of silver nitrate and dissolve it in water (5.1). Transfer it into a 1000 mL volumetric flask and add water (5.1). Dilute to volume and mix.