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

GB/T 9864-2008

Replacing GB/T 9864-1988

**Method for determination of silver in photographic films,
papers, emulsions, fixing baths, effluents, sludges or residues**

胶片、相纸、乳剂、定影液、污水、淤泥或残留物的银量测定方法

(English Translation)

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Foreword

This standard is identical with the American National Standard ANSI/PIMAIT4.42.1998 "photographic process --- Determination of silver content" (English Version). This standard is equivalent to translate ANSI/PIMAIT4.42.1998.

The standard technical content and writing formats and ANSI/PIMAIT4.42.1998 is consistent, for ease of use, made under this standard Column editorial changes.

- a) To be consistent with the original name of national standards and standard name change;
- b) Remove ANSI/PIMAIT4.42.1998 preface, instead of the standard "foreword"; as a direct translation of the introduction of this standard introduction;
- c) reference with the GB/T 1.1-2000 specification defined in the introductory phrase of the document instead of the ANSI/PIMAIT4.42.1998 Specification References introductory phrase file.

The revised standard and replaces GB/T 9864-1988 "Determination of the amount of silver films, papers, emulsions, fixing solution, sewage, sludge or residues method".

This standard compared with GB/T 9864-1988, the main changes are as follows.

- According to GB/T 1.1-2000 prepared at the request scope and normative references;
- Increased principle, accuracy, content security and operational preventive measures (Excerpts Chapter 3, Chapter 4, Chapter 5, 1988 3rd edition Chapter "Method Synopsis");
- Revised the sampling, sample preservation and processing, calculation results and other processes (Chapter 6 edition, Chapter 8, Chapter 9, Chapter 10, 1988 Edition Chapter 6, Chapter 7, Chapter 8);
- Remove the TAA potentiometric titration (1988 Version 8.3);
- Deleted Appendix B.

Appendix A of this standard is a normative appendix.

The standard proposed by China Petroleum and Chemical Industry Association.

The photosensitive material standard by the National Standardization Technical Committee (SAC/TC102) centralized.

This standard was drafted. China Lucky Film Group Corporation.

Introduction

Quality of the products, a black and white or color film, photographic paper and not a small amount of unreduced silver fixing, is its temperature, humidity and radiation Factors contributing stability under various conditions such as shot. Silver color to trace products, and is not being reduced as well as the fixing of unbleached and Unfixed silver dye image caused unnecessary fog density.

Of course, the silver content in the fixer from the economic point of view and the quality is also very important. Fixer recycling is necessary. Back to Silver in terms of income, sludge, residue, scrap paper and film in the silver content value is huge. Also in the assessment of raw, partially processed and completely when processed products, it is necessary to know the content of silver.

Conventional sample preservation technique is not suitable for photosensitive material sample. In processing a solution, usually a silver soluble sulfate form Formula exists. The analysis of heavy metals in waste samples generally stabilized with nitric acid, but nitric oxide can cause precipitation of silver sulfate. In the absence of nitrate , The other components in the waste and even silver complex interactions, produce a variety of soluble and insoluble containing silver unstable system EC. Cyanide iodide solution is to keep the silver in photographic waste solubility and stability of the most effective reagent 1). Cyanide iodide solution is also available for points Analysis of other samples produced during photographic processing (sludge, residues, etc.).

Need to be reminded that the present standard methods for the analysis of metallic silver.

However, these methods generally used for fire assay of precious metals Suppliers People can not serve as an arbitration method. Precious metals sampling should be more careful, so as to ensure a representative collection of typical samples.

The criteria include flame atomic absorption spectrometry (AAS) 2) and iodide potentiometric titration (PT) two analytical methods. Mentioned method for sample storage and handling methods.

Once the sample is fixed iodide, cyanide solution, usually AAS analysis samples. The iodide titration requires digestion to dissolve silver and with the removal of the concentrated sample was boiled in step (digestion A) caused disturbances.

The recommended method is not available for silver analysis sample preparation digestion with standard hydrochloric acid.

1) see reference [5].

2) as the instrument method. inductively coupled plasma atomic emission spectrometry (ICP), direct plasma emission spectrometry (DCP) and X-ray fluorescence spectrometry can to use. Users are responsible for establishing their relevance.

Films, papers, emulsions, fixing baths, effluents, Determination of the amount of silver sludge or residues

1 Scope

This standard specifies the silver mud, residue variety of photographic products and their production, processing generated in the process, and waste processing solutions in silver Determination of the amount, including the sampling, sample preservation and analysis.

Atomic absorption spectrometry (AAS) can be directly used for many types of samples. A method for low-salt waste digestion and washing Water, digestion method B applies to films, papers, sludge, resins and concentrated waste processing.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 20432.1-2006 Photographic grade chemicals - Test methods - Part 1 General (ISO 10349-1:2002, IDT) the first part of the 1982 chemical analysis reagent 1.. ISO 6353-1 General test methods ISO 6353-2. 1983 Reagents for chemical analysis - Part 2. Specification of the first series ISO 6353-3. 1987 Reagents for chemical analysis - Part 3.

Specification of the second series Principle 3

3.1 Flame atomic absorption spectrometry (AAS)

Silver hollow cathode lamp heating the excitation and emission spectra of the ultraviolet radiation comprising silver atoms band. The silver ions in solution is sucked Flame, when the mercury lamp emitted light by a flame, the silver ions to silver according to Beer's law relationship absorption spectral emissivity see equation (1).

Where.

Ba concentration of silver ions Ag ---;

K --- constant.

Often used to establish the calibration curve method to clear this relationship.

3.2 Potentiometric titration analysis (PT)

Iodide solution was titrated with silver ion containing solution, will precipitate silver iodide formed following relationship.

$\text{Ag}^{++} + \text{I}^{-} \rightarrow \text{AgI (solid)}$ Whether silver electrode rod made of silver (10.1.2) or with a suitable reference electrode than choice silver iodide electrode made in A solution containing silver ions are generated potential.

Occurs when an excess of iodide ions, the silver ion concentration, see formula (2).

Where.

--- 1 Ba concentration of iodide ion.