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Man-made fibers-Determination of heavy metal content-Inductively coupled plasma optical emission spectrometry(ICP-OES) and inductively coupled plasma mass spectrometry(ICP-MS)

化学纤维 重金属含量的测定 电感耦合等离子体发射光谱法和电感耦合等离子体质谱法

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Foreword

This document complies with the provisions of GB/T 1:1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

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This document is proposed and coordinated by the National Chemical Fiber Standardization Technical Committee (SAC/TC586):

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Determination of heavy metal content in chemical fibers Inductively coupled plasma optical emission spectrometry and Inductively coupled plasma mass spectrometry Warning: Personnel using this document should have practical experience in regular laboratory work: This document does not identify all possible security issues:

Users are responsible for taking appropriate safety and health measures and ensuring compliance with the conditions stipulated in relevant national regulations:

1 Scope

This document describes the use of inductively coupled plasma optical emission spectrometry and inductively coupled plasma mass spectrometry for the determination of lead in chemical fibers:

(Pb), copper (Cu), zinc (Zn), iron (Fe), manganese (Mn), silver (Ag), arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), nickel (Ni), mercury (Hg), Method for tin (Sn) heavy metal element content:

This document is applicable to the determination of heavy metal content in some chemical fibers, including polyester, nylon, spandex, acrylic, polypropylene, meta-aramid, para Aramid, regenerated cellulose fiber, polyvinyl alcohol fiber, ultra-high molecular weight polyethylene fiber: Reference for determination of heavy metal content in other chemical fibers use:

2 Normative reference documents

GB/T 602

GB/T 4146

3 Terms and definitions

The terms and definitions defined in GB/T 4146 (all parts) apply to this document:

4 Principles

The chemical fiber is dissolved in nitric acid and hydrogen peroxide, and then digested by microwave: After filtration, an inductively coupled plasma optical emission spectrometer was used for Determination, the emission intensity of each heavy metal element is measured at the corresponding analysis wavelength, and the concentration of each heavy metal element is determined according to the standard working curve:

degree to calculate the content of each heavy metal element:

Or after filtration, use an inductively coupled plasma mass spectrometer to measure, and use the specific mass number (mass-to-charge ratio, m/z) of the element to identify it:

The intensity ratio of the mass spectrum signal of the measured element and the mass spectrum signal of the internal standard element is proportional to the concentration of the element to be measured for quantitative analysis:

5 Reagents or materials

Unless otherwise stated, only reagents and laboratory grade water confirmed to be of superior purity are used in analyses:

5:1 Nitric acid, mass fraction 65%~68%: