

YS

**NONFERROUS METALS INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

YS/T 1658.4-2023

**Methods for chemical analysis of crude nickel cobalt hydroxide - Part 4:
Determination of copper, aluminum, lithium, zinc, cadmium, lead and arsenic
contents - Inductively coupled plasma atomic emission spectrometry**

粗氢氧化镍钴化学分析方法 第4部分：铜、铝、锂、锌、镉、铅、砷含量的测定
电感耦合等离子体原子发射光谱法

(English Translation)

Issued on: December 29, 2023

Implemented on: July 1, 2024

**Issued by: Ministry of Industry and Information Technology of the
People's Republic of China**

Table of Contents

Foreword	
Introduction	
1 Scope	
2 Normative references	
3 Terms and definitions	
4 Principle	
5 Reagents	
6 Instruments and apparatus	
7 Samples	
8 Test procedures	
9 Test data processing	
10 Precision	
11 Test report	
Annex A (informative) Original data of the precision test	

Foreword

This document was issued on 29 December 2023 by the Ministry of Industry and Information Technology of the People's Republic of China, and has applied since 1 July 2024.

It is a YS/T standard: a recommended industry standard of China's non-ferrous metals industry.

Introduction

YS/T 1658, Methods for chemical analysis of crude nickel cobalt hydroxide, consists of seven parts: Part 1, nickel content by the dimethylglyoxime gravimetric method; Part 2, chromium, phosphorus and manganese contents by inductively coupled plasma atomic emission spectrometry; Part 3, fluorine content by the ion selective electrode method; Part 4, copper, aluminium, lithium, zinc, cadmium, lead and arsenic contents by inductively coupled plasma atomic emission spectrometry; Part 5, moisture content by the gravimetric method; Part 6, insoluble substance in hydrochloric acid by the gravimetric method; Part 7, manganese content by potentiometric titration.

1 Scope

This document describes the methods for the determination of copper, aluminum, lithium, zinc, cadmium, lead and arsenic contents in crude nickel cobalt hydroxide.

This document is applicable to the determination of copper, aluminum, lithium, zinc, cadmium, lead and arsenic contents in crude nickel cobalt hydroxide. See Table 1 for the determination range.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this document. For dated references, only the edition cited applies. For undated references, the latest edition (including any amendments) applies.

GB/T 6682 Water for analytical laboratory use - Specification and test methods

YS/T 1460-2021 Crude nickel cobalt hydroxide

3 Terms and definitions

No terms and definitions are defined in this document.

4 Principle

The test portion is dissolved in hydrochloric acid. In a hydrochloric acid medium, the emission intensities of copper, aluminum, lithium, zinc, cadmium, lead and arsenic are determined using an inductively coupled plasma atomic emission spectrometer. The concentration of each element is obtained from the working curve and the mass fraction is calculated accordingly.

5 Reagents

Unless otherwise specified, guaranteed reagents or superior shall be used for the purpose of this document.

5.1

Water, Grade 2 or superior as defined in GB/T 6682.

5.2

Hydrochloric acid (1+1).