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

GB/T 41322-2022

**Hardmetals - Determination of silicon in cobalt metal powders -
Photometric method**

Issued on: March 9, 2022

Implemented on: October 1, 2022

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

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5.1 Hydrofluoric acid, the mass fraction is 40%.

5.2 Nitric acid, the mass fraction is 65%.

5.3 Hydrochloric acid, the mass fraction is 30%.

5.4 Sulfuric acid, the mass fraction is 96%.

5.5 Perchloric acid, the mass fraction is 70%.

5.6 Sodium hydroxide solution, the mass fraction is 30%.

5.7 Boric acid.

5.8 Sodium molybdate.

5.9 Sulfamic acid.

5.10 Methyl isobutyl ketone.

5.11 Acetone.

5.12 Water.

5.13 Nitrogen.

5.14 Silicon standard solution, 100 µg/mL.

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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 of Standardization Documents" drafted.

This document is modified using ISO 11877.2008 "Spectrophotometric Method for Determination of Silicon in Cemented Carbide Cobalt Powder".

Two chapters "Normative References" and "Terms and Definitions" have been added to this document.

The technical differences between this document and ISO 11877.2008 and their reasons

are as follows.

--- The silicon content range is changed from "20µg/g~300µg/g" to "5µg/g~300µg/g" (see Chapter 1, ISO 11877.2008

Chapter 1), silicon is an impurity element in cobalt powder, and my country has strict requirements on the content of silicon in cobalt powder, often requiring less than 20µg/g, and change the silicon content range to meet my country's control requirements for silicon content in cobalt powder.

--- Deleted "Platinum thimble for weighing samples" (see 4.4 of ISO 11877.2008), because it is not necessary to use white

The gold thimble weighs the sample, and the sample can be directly weighed into the distillation flask, which is easier to operate.

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

1 Scope

This document specifies the spectrophotometric method for the determination of the amount of silicon in cobalt powder, and the content of silicon is 5µg/g~300µg/g.

This document applies to the determination of silicon content in cemented carbide cobalt powder.

2 Normative references

There are no normative references in this document.

3 Terms and Definitions

There are no terms and definitions that need to be defined in this document.

4 Principles

The sample was treated with mixed acid and distilled to form silicon tetrafluoride, which was absorbed by the mixed solution of boric acid and sodium molybdate, and extracted with methyl isobutyl ketone.

The obtained silico-molybdate complex was measured, and the absorbance of the methyl isobutyl ketone phase solution was measured.

5 Reagents

Use high-purity reagents and double-distilled water or water of the same purity in the analysis.

6 Instruments and equipment

All instruments and equipment that come into contact with reagents should be made of silicone-free materials, such as. polytetrafluoroethylene (PTFE), polypropylene (PP), polyethylene