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

GB/T 29056-2025

Replacing GB/T 29056-2012

**Determination of impurity content in trichlorosilane for silicon
epitaxy - Inductively coupled plasma mass spectrometry**

硅外延用三氯氢硅中杂质含量的测定 电感耦合等离子体质谱法

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1 Scope

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.

This document replaces GB/T 29056-2012 "Chemical Analysis Method of Trichlorosilane for Silicon Epitaxy, Boron, Aluminum, Phosphorus, Vanadium, Chromium, Manganese, Iron, Cobalt, The "Determination of Nickel, Copper, Molybdenum, Arsenic and Antimony by Inductively Coupled Plasma Mass Spectrometry" has been revised compared to GB/T 29056-2012, except for structural adjustments and compilation.

Aside from the logical changes, the main technical changes are as follows.

- a) The determination of elements such as lithium and sodium has been added, and the determination range has been changed (see Chapter 1, Chapter 1 of the 2012 edition);
- b) The methodology has been modified (see Chapter 4, Chapter 2 of the 2012 edition);
- c) Increased interference factors (see Chapter 5);
- d) Experimental conditions were increased (see Chapter 6);
- e) Reagents and materials have been changed (see Chapter 7, Chapter 3 of the 2012 edition);
- f) Changes were made to the instruments and equipment (see 8.1, Chapter 4 of the 2012 edition);
- g) Requirements for analytical balances, electric heating plates, and glassware have been added (see 8.2~8.8);
- h) Increased requirements for sample collection (see Chapter 9);
- i) The security measures in the analysis steps have been removed (see 5.1 in the 2012 version);
- j) Added instrument preparation (see 10.1);
- k) The procedures for preparing and determining the samples, parallel tests, and standard solutions have been modified (see 10.2, 10.3, 10.5, 10.7, 2012 edition). 5.2, 5.3, 5.5, 5.6);

l) The precision requirements have been changed (see Chapter 11, Chapter 7 of the 2012 edition);

m) Quality Assurance and Control has been removed (see Chapter 8 of the 2012 edition);

n) The test report has been amended (see Chapter 12, Chapter 9 of the 2012 edition).

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was prepared by the National Technical Committee on Standardization of Semiconductor Equipment and Materials (SAC/TC203) and the National Semiconductor Equipment and Materials Standards Committee.

It was jointly proposed and is under the jurisdiction of the Materials Subcommittee of the Chemical Technology Committee (SAC/TC203/SC2).

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This document was first published in 2012, and this is its first revision.

Determination of impurity content in trichlorosilane used for silicon epitaxy Inductively Coupled Plasma Mass Spectrometry Warning---Personnel using this document should have practical experience working in a formal laboratory. This document does not address all possible safety issues.

Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.

1 Scope

This document describes the components of trichlorosilane used in silicon epitaxy, including lithium, boron, sodium, magnesium, aluminum, potassium, calcium, phosphorus, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, and gallium.

Inductively coupled plasma mass spectrometry method for determining elements such as

molybdenum, arsenic, and lead.

This document applies to the determination of impurity element content in trichlorosilane used for silicon epitaxy. The determination ranges for each element are shown in Table 1.

Table 1. Measurement range of each element
Measurement range ng/g
Lithium 0.01~10
Boron 0.01~10
Sodium 0.01~10
Magnesium 0.01~10
Aluminum 0.01~10
Potassium 0.01~10
Calcium 0.01~10
Phosphorus 0.01~10
Titanium 0.01~10
Vanadium 0.005~10
Chromium 0.01~10
Manganese 0.01~10
Iron 0.01~10
Cobalt 0.005~10
Nickel 0.01~10
Copper 0.01~10
Zinc 0.01~10
Gallium 0.01~10
Molybdenum 0.005~10
Arsenic 0.01~10
Lead 0.01~10