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Steel and iron — Determination of calcium and magnesium — Inductively coupled plasma atomic emission spectrometric method

Aciers et fontes - Détermination du calcium et du magnésium - Méthode par spectrométrie d'émission atomique avec plasma induit

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Foreword

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The committee responsible for this document is ISO/TC 17, *Steel*, Subcommittee SC 1, *Methods of determination of chemical composition*.

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Steel and iron — Determination of calcium and magnesium — Inductively coupled plasma atomic emission spectrometric method

1 Scope

This International Standard specifies a method for determination of calcium and magnesium contents in iron, cast iron, steel, and alloyed steel by inductively coupled plasma (ICP) atomic emission spectrometry.

The method is applicable to the determination of calcium and magnesium contents (mass fraction) in the range of 0,000 5 % to 0,006 % and 0,000 5 % to 0,20 %, respectively.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 385, *Laboratory glassware — Burettes*

ISO 648, *Laboratory glassware — Single-volume pipettes*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition*

3 Principle

A test portion is dissolved in a hydrochloric, nitric and hydrofluoric acid mixture and fumed with perchloric acid. Hydrochloric acid, nitric acid, and an internal standard element (if used) are added and the solution is diluted to a known volume. The solution is filtered if necessary, nebulized into an ICP spectrometer and the intensity of the emitted light from each element measured simultaneously with the intensity of the light emitted by the internal standard element.

4 Reagents

During the analysis, unless otherwise stated, use only reagents of recognized analytical grade with very low calcium and magnesium contents and only grade 2 water as specified in ISO 3696.

4.1 Pure iron, containing less than 0,5 µg/g of calcium and magnesium.

4.2 Hydrochloric acid, ρ about 1,19 g/ml.

4.3 Hydrochloric acid, ρ about 1,19 g/ml, diluted 1 + 1.

4.4 Hydrochloric acid, ρ about 1,19 g/ml, diluted 1 + 4.

4.5 Hydrochloric acid, ρ about 1,19 g/ml, diluted 1 + 100.

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