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National Standard of the People's Republic of China

中华人民共和国国家标准

GB/T 4336-2002
Replace GB/T 4336-1984

**Standard Test Method for Spark Discharge Atomic
Emission Spectrometric Analysis of Carbon and
Low-Alloy Steel (Routine Method)**

碳素钢和中低合金钢火花源原子发射光谱分
析方法（常规法）

Issued on September 11, 2002

Implemented on February 01, 2003

**Issued by the General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Foreword

This standard is the revision of "Method for Photoelectric Emission Spectroscopic Analysis of Carbon Steel Medium and Low Alloy Steel" (GB/T 4336 - 1984).

This national standard will replace "Method for Photoelectric Emission Spectroscopic Analysis of Carbon Steel Medium and Low Alloy Steel" (GB/T 4336 - 1984) from the implementation date of this standard

Compared with the former standard, this standard is revised in the following aspects: "2 Normative References" is added; the relevant content in "5 Counter Electrode" and "8 analytical sample" in the former standard are altered into "4 Apparatus" and "5 Sampling and Sample Preparation" respectively in this standard; determinations of arsenic and tin are added; measurement range of all elements are expanded; analytical sample diameter is changed from "25mm ~ 60mm" to "being greater than 16mm"; analytical sample thickness is changed from "10mm ~ 60mm" to "being greater than 2mm"; spectrometer "focal distance" is changed from "0.75m~ 2.0m" to "0.50m ~ 1.0m" and spectrometer wavelength coverage from "170.0nm ~ 400.0nm" to "165.0nm ~ 511.0nm"; in analysis condition, "pre-spark time" and "integration time" are changed from "5s ~ 40s" and "5s ~ 25 s" to "3s ~ 20s" and "3s ~ 20s" respectively.

Former standard name, "Method for Photoelectric Emission Spectroscopic Analysis of Carbon Steel Medium and Low Alloy Steel", is changed into "Standard Test Method for Spark Discharge Atomic Emission Spectrometric Analysis of Carbon and Low-Alloy Steel" (Routine Method) in this standard

"11 Allowable Differences" and "in-door and between-room allowable difference" in the former standard are replaced by "10 Precision" and "repeatability and reproducibility function formulae" in this standard respectively.

This standard was proposed by former State Bureau of Metallurgical Industry.

This standard is under the jurisdiction of the National Steel Standardization Technical Committee.

Responsible Drafting Organization: Central Iron & Steel Research Institute

Chief Drafting Staff: Chen Jiwen and Yang Dong

This standard was firstly issued in 1984.

1 Scope

This national standard specifies the method to determine the content of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, tungsten, molybdenum, vanadium, aluminium, titanium, copper, niobium, cobalt, boron, zirconium, arsenic and tin in carbon and low alloy steel with spark discharge atomic emission spectra.

Method is applicable to the analysis of as-cast and forged/rolled samples from electric heater, induction furnace, electro-slag furnace and convertor.

This method may simultaneously measure the 19 elements in carbon steel and low alloy steel and each element measurement range are stated in Table 1.

Table 1: Measurement Range of Each Element

Element	Measurement range (mass fraction) / %
C	0.005 ~ 1.20
Si	0.005 ~ 3.50
Mn	0.003 ~ 2.00
P	0.003 ~ 0.15
S	0.002 ~ 0.070
Cr	0.001 ~ 2.50
Ni	0.001 ~ 5.00
W	0.005 ~ 2.00
Mo	0.005 ~ 1.20
V	0.005 ~ 0.70
Al	0.001 ~ 1.50
Ti	0.001 ~ 0.90
Cu	0.005 ~ 1.0
Nb	0.005 ~ 0.50
Co	0.005 ~ 0.40
B	0.0005 ~ 0.010
Zr	0.002 ~ 0.16
As	0.002 ~ 0.30
Sn	0.002 ~ 0.30

2 Normative References

The following standard contains provisions which, through reference in the following text, constitute provisions of this standard. For dated reference, subsequent amendments (excluding correction) to, or revisions of, any of these publications do not apply. However, parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. For undated references, the latest edition of the normative document referred to applies.

GB/T 14203-1993 "General Rule for Photoelectric Emission Spectroscopic Analysis of Iron, Steel and Alloy"

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