

INTERNATIONAL STANDARD

ISO
11885

First edition
1996-12-15

Water quality — Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy

*Qualité de l'eau — Dosage de 33 éléments par spectroscopie
d'émission atomique avec plasma couplé par induction*



Reference number
ISO 11885:1996(E)

Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11885 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

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Printed in Switzerland

Water quality — Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy

1 Scope

1.1 Field of application

This International Standard specifies a method for the determination of dissolved, particulate or total elements in raw, potable and waste water for the following elements:

aluminium, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, molybdenum, nickel, phosphorus, potassium, selenium, silicon, silver, sodium, strontium, sulfur, tin, titanium, tungsten, vanadium, zinc, zirconium.

Table 1 lists these elements along with the recommended wavelengths and typical estimated instrumental detection limits using conventional pneumatic nebulization. Actual working detection limits are sample-dependent and as the sample matrix varies, these concentrations can also vary.

Because of the differences between various makes and models of satisfactory instruments, no detailed instrumental operating instructions can be provided. Instead, the analyst will need to refer to the instructions provided by the manufacturer of the particular instrument.

1.2 Interferences

Table 2 lists elements and the most important spectral interferences at the wavelengths recommended for analysis.

Several types of interference effects can contribute to inaccuracies in the determination of trace elements. They can be summarized as follows.

a) Spectral interferences, categorized as:

- 1) overlap of a spectral line from another element; these effects can be compensated by utilizing computer correction of the raw data;
- 2) unresolved overlap of molecular band spectra; these effects can possibly be overcome by selection of an alternative wavelength.

If the appropriate equipment is available, wavelength scanning can be performed to detect potential spectral interferences.

b) Background influences, categorized as:

- 2) background contribution from continuous or recombination phenomena;
- 3) background contribution from stray light from the line emission of elements in high concentration.

The effect of background interferences can usually be compensated by background correction adjacent to the analyte line.