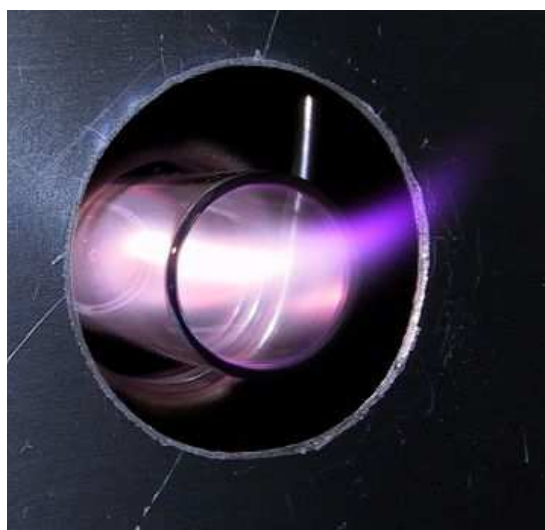


# ICP-OES

Inductively Coupled Plasma – Optical Emission Spectroscopy



## Sample Requirements

Metal samples, chips, powder, solutions: sample quantity minimum of 1 – 100 mg for major elements and 100 – 1000 mg for trace elements.

Sample preparation via micro-wave, high-pressure, melting and acids.

## Applications

- Steels
- Nickel based alloys
- Titanium based alloys
- Non-ferrous and light metals
- Special alloys, superconductors
- Ores, stones, minerals, carbons
- Ashes, glasses, ceramics
- Water and waste water samples
- Oils, organic liquids and solids
- Thin-layer analysis
- Oxides and mixed oxides

## Specifications

Approx. 70 detectable elements, in concentration ranges from several µg/l to g/l in solutions or from 0.0001 % to 100 % in solids.

Accuracy: 1 – 3 % for major elements, 5 – 20 % for trace elements relative.

## Test Standard Excerpt

EN 14242 JIS-H 1307 Manual for Steel Works Laboratory	Aluminum and Aluminum Alloys
EN 13800 JIS H 1123 Manual for Steel Works Laboratory	Lead and Lead Alloys
DIN EN ISO 11885 ( E22 )	Liquids and Solids
ISO 7627-1 Manual for Steel Works Laboratory	Hard Metals
ASTM E 478 JIS H 1012 JIS H 1201 Manual for Steel Works Laboratory DIN EN 15605	Copper and Copper Alloys
ISO 13898 Manual for Steel Works Laboratory DIN EN 10351	Steel, Alloyed and Steel, Non-alloyed
ASTM E 2371 JIS H 1611 Manual for Steel Works Laboratory	Titanium and Titanium Alloys
ASTM E 1277 DIN EN 14242 Manual for Steel Works Laboratory	Zinc and Zinc Alloys

## Methods

ICP-OES (inductively coupled plasma – optical emission spectroscopy) utilizes a feature of elements that atoms absorb energy from an inductively coupled plasma, are transformed to an excited state and release a characteristic radiation while returning to their ground state. Identification of this radiation enables qualitative determination of a sample. Quantitative determination is based on the proportionality of radiation intensity and element concentration in calibration and analytical samples.

In ICP-OES analysis the dissolved sample is atomized and then injected into the inductively generated argon plasma and excited. The emitted radiation is transferred to the ICP spectrometer and is there separated into individual wavelengths and evaluated. The intensity of the spectral lines are measured with CID semiconductor detectors. Calibration is performed with multielement solutions that are mixed from standard solutions.

## Our Services (Analysis)

Analysis of metals and non-metals

**Al, As, Au, B, Ba, Bi, Ca, Cd, Ce, Co, Cr, Cu, Fe, Hg, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Pt, Sb, Sc, Se, Si, Sn, Te, Ti, U, V, W, Zn, and Zr and many more.**

The method is suitable for multielement determination in solutions or solids which have been dissolved as a part of sample preparation.

Particularly suited for stoichiometric determinations, material inspections and material determinations



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