

Inductively Coupled Plasma Spectrometer (ICP)



Make	Model
Perkin Elmer, U.S.A.	Optima-3300 RL

Brief Description:

Inductively Coupled Plasma Spectrometer (ICP): Atomic Emission Spectrometer Perkin Elmer Optima 3300 RL Range: 165-782 nm; Detection limit: up to ppb level; SCD detector for simultaneous detection of 60 elements; Nebulizer for organic samples Trace/ultratrace element analysis of almost all elements; Simultaneous detection of multiple elements.

- ❖ ICP is an instrument that gives elemental analysis of sample. This technique of analysis is called Optical Emission Spectroscopy (OES)
- ❖ When atoms are excited with sufficiently high energy they tend to emit characteristic radiation while returning to ground state.
- ❖ In ICP the sample is injected in a argon plasma flame where it faces intense heat and the molecules of sample are separated in to excited atoms and ions. These atoms and ions emit radiation, which is detected with a polychromator and SCD (Segmented Array Charge coupled Device) Detector.
- ❖ The ICP can analyze a whole spectrum of elements at a time by better technique and employing a SCD detector covering a range of 165nm to 403nm in UV and Visible range of spectra is 404 nm to 782 nm.
- ❖ ICP is an energetic source, emitting many thousands of wavelengths, and producing a complex spectrum
- ❖ Each element produces some or many emission lines, few of which are quite prominent and are characteristic of the particular element *These lines are segregated from other lines of interferences and compared with the known spectra of the element giving the affirmation of presence of the particular element
- ❖ Has ability to measure 70 elements at multiple wavelengths in less than a minute, which is cheaper and time saving.

Specifications:

- ❖ Simultaneous Detection
- ❖ RF frequency: 40 MHz.
- ❖ RF Power: 750 to 1500 watts
- ❖ Pump: 3-channel peristaltic pump 0.2 to 2.5 ml/min in 0.1ml increments
- ❖ Spectrometer: 6000 pixel SCD Detector, 5000 Emission line resolution
- ❖ Range: 165 to 782 nm for UV & VIS
- ❖ Results: 60 elements can be detected in 1 min.

Applications:

- ❖ Environment, Steel-alloy, Petro-chemical, Chemicals, Minerals, Agriculture, Ceramic-Refractory, Clinical Pharmaceutical, Food-Feed, Plastic-Polymer, Catalyst- pigment, Geochemistry-Mining etc.

Microwave Digestion system :

Make: M/S. Milestone S.R.L. Italy

Model: Ethos D Microwave lab station

Major Specification: -Power : 230 V/50Hz, 2.4 K watt
-Ethos D Microwave Hardware
-Control Terminal
- Software
- SK 10 TP Starter Kit for Temperature and Pressure control with 10 segmented rotors
-HPV -100TMF Vessel 100ml

Microwave Sample Preparation for ICP :

- The modern laboratory is a factory for analysis
 - Analytical tools of the 21st century (AAS, ICP-AES, ICP-MS)
 - Sample preparation tools of the 18th century (heating block, sand bath, bunsen burner)
- Sample preparation has become the bottle neck to higher productivity in the modern analytical laboratory
- Microwave eliminates the bottle neck in sample preparation for AA and ICP
- No losses of volatile elements, complete recovery of Hg, Se, As etc.
- Low blanks, minimum quantities of acids are used
- No sample contamination from the environment or from other samples
- Reproducible and fully documented sample preparation procedure
- No acid fumes for improved laboratory personnel and working conditions

Microwave Digestion Use for sample preparation of different area of the samples like:

Agriculture, Ceramic Refractory, Clinical Pharmaceutical, Food-feed, Metal Alloy, Plastic –Polymer, Catalyst- Pigment, Chemical, Environment, Geochemistry- Mining etc.