

Atomic Absorption Spectrophotometers (AAS)



Atomic absorption spectroscopy (AAS) determines the presence of metals in liquid samples. Metals include Fe, Cu, Al, Pb, Ca, Zn, Cd and many more. It also measures the concentrations of metals in the samples. Typical concentrations range in the low mg/L range.

In their elemental form, metals will absorb ultraviolet light when they are excited by heat. Each metal has a characteristic wavelength that will be absorbed. The AAS instrument looks for a particular metal by focusing a beam of UV light at a specific wavelength through a flame and into a detector. The sample of interest is aspirated into the flame. If that metal is present in the sample, it will absorb some of the light, thus reducing its intensity. These instruments measure the change in intensity. A computer data system converts the change in intensity into an absorbance.

Features

- **The patented flame analysis technique adopting oxygen-rich air-acetylene flame as the substitution for nitrous oxide-acetylene flame for high temperature element analyses. (Only for WFX-110A)**
- **Automatic hollow cathode lamp changeover. The high performance HCL can be used directly.**
- **Auto-changeover and position optimization of integrated flame/graphite furnace atomizer.**
- **Auto-ignition, automatic spectral bandwidth selection.**
- **Fully automated wavelength scanning and peaking**
- **Light-controlled graphite furnace power supplier, adopting FUZZY-PID temperature control technique and dual curve working mode, ensures fast heating, accurate and stable temperature control and good temperature reproducibility. Temperature auto-correction function provided.**
- **Graphite furnace with pneumatic control and pressure lock ensures constant pressure and reliable contact.**

Features Continued

- Perfect safety protection measures, alarm and automatic safety protection to fuel gas leakage, air pressure deficiency and abnormal flame extinction; spray chamber made of explosion-proof material, all-titanium burner and explosion-proof stopper for flame analyses; alarm and protection function to argon pressure deficiency, insufficient cooling water supply, over-heating and over-current etc. in graphite furnace analyses.
- Adopting large-scale programmable logic array and Inter IC bus technique and highly reliable adapters for electric design.
- Easy and flexible WINDOWS operating system, with multi-windows processing technology to observe the signal profile, the measured results and the calibration curve at the same time. Various analytical programs, data, signals and graphics can all be stored for later use.

Description:

Model WFX-110A

Atomic Absorption, flame & graphite furnace type. Fully automatic PC control, 6-lamp turret, D2 & S-H background correction. Air-C₂H₂ flame and patented air-C₂H₂-O₂ flame (Substitution for N₂O-C₂H₂ flame) with graphite furnace one touch changing. Complete with graphite furnace system, software and Cu, Mg, Hg, Cd, Ba Lamps

Model WFX-110B

Atomic Absorption Spectrophotometer, flame type. Fully automatic PC control, 6-lamp turret, D2 & S-H background correction. Air-C₂H₂ flame and patented air-C₂H₂-O₂ flame (Substitution for N₂O-C₂H₂ flame). Complete with the software and Cu, Mg, Hg and Ba Hollow Cathode Lamps

Model WFX-120A

Atomic Absorption, flame & graphite furnace type. Fully automatic PC control, 6-lamp turret, D2 & S-H background correction. Air-C₂H₂ flame and graphite furnace one touch changing. Complete with graphite furnace system, software and Cu, Mg, Hg, Cd Lamps

Model WFX-120B

Atomic Absorption Spectrophotometer, flame type. Fully automatic PC control, 6-lamp turret, air-C₂H₂ flame, D2 & S-H background correction. Complete with the software and Cu, Mg, Hg Hollow Cathode Lamps

Model WFX-130A

Atomic Absorption, flame & graphite furnace type. Automatic PC control, 4-lamp turret, D2 background correction. Air-C₂H₂ flame and graphite furnace one touch changing. Complete with graphite furnace system, software and Cu, Mg, Hg, Cd Lamps

Performance:

Wavelength Range and Wavelength Precision:

Range: 190~900nm

Precision: ± 0.5 nm

Resolving Power:

Can resolve the 279.5nm and 279.8nm Mn double lines and the wave trough energy between them is less than 40%.

Characteristic Concentration (or Characteristic Quantity), Detection Limit and Relative Standard Deviation (Precision) of Representative Elements:

1) CC, D.L. and R.S.D of Air-acetylene Flame Method:

Element: Cu, Wavelength: 324.7nm

CC ≤ 0.04 mg/L/1%, D.L. ≤ 0.007 mg/L, R.S.D $\leq 1\%$

2) CC of Air-acetylene-oxygen Flame Method:

Note: WFX-120/130 type instruments have NOT this project!

Element: Ba, Wavelength: 553.6nm

CC ≤ 0.22 mg/L/1%

3) CQ and R.S.D of Graphite Furnace Method:

Element: Cd, Wavelength: 228.8nm

CQ $\leq 1 \times 10^{-12}$ g, R.S.D $\leq 5\%$

Stability:

Element: Cu, Wavelength: 324.7nm

Zero Drift of Static Base Line in 30min ≤ 0.005 Abs

Zero Drift of Dynamic Base Line in 10min ≤ 0.006 Abs

Background (BG) Correction Ability:

D₂ lamp method: When BG absorption is near to 1Abs, BG correction ability is more than 30 times.

S-H method (WFX-130 type instrument has NOT this function): When BG absorption is near to 1.8Abs, BG correction ability is more than 30 times.

Linearity of Calibration Curve:

Flame method, Element: Cu

Linear Range ≥ 0.6 Abs, Linear Correlation ≥ 0.995

Specifications:

Wavelength Range:

190~900nm

Light Source:

Hollow Cathode Lamp, D₂ Lamp

Modulation Mode:

Square Wave Pulse

Modulation Frequency:

400Hz (D₂ lamp BG correction or No BG correction) 100Hz (S-H BG correction)

Optical system:

Czerny-Turner Monochromator

Grating:

Plane diffraction grating with 1800lines/mm

Twinkle Wavelength:

250nm

Focus:

277mm

Band Pass:

0.1, 0.2, 0.4 and 1.2nm

Wavelength Optimization:

Auto-wavelength, Wavelength Scan (WFX-110/120) Manual-wavelength, Wavelength Scan (WFX-130)

Specifications Continued

Atomization System:	Pre-mix 100mm single slot burner (Flame method) Flame emission burner (WFX-110/120) Graphite furnace atomizer (Graphite furnace method) Hydride generator (Hydride method, Option)
Ignition Mode:	Automatic
Safety Features:	Flame off protection and alarm Fire failure protection and alarm Air pressure relief protection and alarm Combustion gas leakage protection and alarm
Data Processing System:	Supply the Abs value, Concentration, Content and Emitting Intensity (WFX-130 type doesn't provides this option). Read modes include instantaneous value (peak value), integral value, peak area value. Display the data, signal graph and fitting curve.
Signal Processing Function:	Standard calibration and Standard Addition Method. Standard samples number can be selected from 1 to 10. Re-slope Function and Statistical Average.
Information Memory:	Working Conditions, Analyzing Data Table, Analyzing Reports and Signal Outline.
Power Requirements:	110V/220V, 50Hz/60Hz, 200VA
Instrument Dimensions:	102 (W)×49 (D)×54 (H)cm
Weight:	80kg