

Flame-Graphite Furnace AAS

AS2300

Features

- Graphite Furnace Visualization Technology;
- Safety Assurance: Advanced and reliable safety protection system;
- Advanced Optical Design;
- Streamlined Industrial Design;
- Integrated flame and graphite furnace design;
- High-Performance Autosampler: Supports 85-position autosampling and online dilution;
- Multi-Element Rapid Analysis;

Application

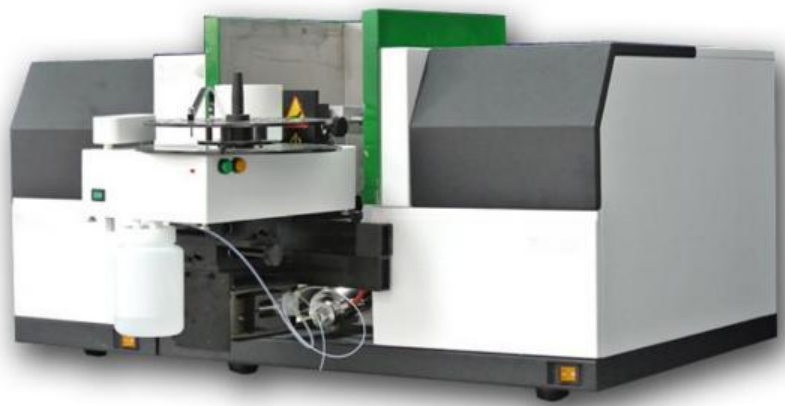
- Minerals: rare earth analysis and precious metals analysis
- Environmental : Environmental Protection & Water quality testing
- Material science: alloy materials & building materials
- Scientific research: Elemental quantitative analysis in scientific research such as medical and health, and higher education institutions

Description

The Flame-Graphite Furnace Integrated Atomic Absorption Spectrophotometer AS2300 is a new product meticulously crafted by Optosky. The multimedia graphite furnace visualization system allows intuitive monitoring of the dynamic changes of the sample solution inside the graphite tube during drying, ashing, and burning processes. It facilitates the observation of the optimal position and depth for the autosampler capillary needle insertion into the graphite tube, as well as the placement of the platform inside the graphite tube, ensuring analytical accuracy and extending the graphite tube's lifespan.

The advanced optical design incorporates an integrated suspended vibration-isolation optical platform that enhances anti-vibration capability and prevents temperature changes from affecting the optical system, ensuring stable optical signals. It supports 85-position auto sampling and online dilution, significantly simplifying analytical operations and improving analytical efficiency.

Additionally, this instrument combines flame, graphite furnace, and hydride generation functionalities, allowing analysis from high concentration ppm levels to trace ppb levels without needing to switch atomizers. This greatly simplifies operation. The six-lamp automatic turret system enables rapid multi-element analysis. The AS2300 also features an advanced and reliable safety protection system, providing comprehensive safety for operators. flow cytometry, cell sorting, optical instruments, spectroscopic analysis, interference, metrology, holography, and physical experiments.



1. Parameter

Model	AS2300	AS2300-ALS
Wavelength Range	190~900nm	
Grating Line Density	1800 lines /mm	
Absorbance Range	-0.1~2.5ABS	
Wavelength Repeatability	≤0.05nm	
Wavelength Accuracy	Full spectrum ±0.15 nm	
Optical System	Integrated optical platform, fully enclosed optical system (single beam)	
Detector	Photomultiplier tube	
Resolution	Able to separate manganese doublet lines (279.5 and 279.8 nm) with a spectral bandwidth of 0.2 nm and a valley-to-peak energy ratio of <30%	
Spectral Slits	0.1nm,0.2nm,0.4nm,0.7nm,1.0nm,2.0nm (automatically switchable)	
Background Correction Technology	D2 background subtraction (background signal 1 ABS, background reduction capability ≥50 times)	
Static Baseline Drift	≤0.002ABS/30min (Cu)	
Lamp Holder	Standard 6-lamp turret, optional 8-lamp turret	
Characteristic Concentration	Cu≤10× 10 ⁻¹² g , Cd ≤0.4× 10 ⁻¹² g,	
Measurement Repeatability	Cu≤2% , Cd ≤2%	
Detection Limit	Cd ≤0.3pg	

Gas Flow Control	Needle valve control	
Safety Protection	Automatic gas cut-off for low pressure, power interruption, abnormal flameout, and burner mismatch; automatic temperature shutdown for overheating	
Background Subtraction Method	Self-absorption background subtraction, deuterium lamp background subtraction	
Burner	Air-acetylene flame burner 100mm	
Nebulizer Chamber	Polypropylene coated	
Ignition Method	Automatic ignition	
Ignition Dynamic Baseline Drift	$\leq 0.003 \text{ ABS}/30 \text{ min}(\text{Cu})$	
Maximum Heating Rate	$\geq 3000^\circ\text{C}/\text{s}$	
Graphite Furnace Operating Temperature	Room temperature~3000°C	
Temperature Control Accuracy	$\leq 1\%$	
Power	6000W peak instantaneous power	
Dimensions	700*550*440(mm)	
Weight	80kg	
Autosampler	Not included	85-position autosampler

Table 1: Performance Parameters of Flame-Graphite Furnace Integrated Atomic Absorption Spectrophotometer AS2300

2. Product Features:

(1) Gas Control System (Standard Configuration)

Utilizes two separate gas control paths, one inside the tube and one outside. During analysis, the outside of the tube remains ventilated while the inside gas flow stops during the atomization stage. This effectively protects the graphite tube, maximizes its lifespan, and ensures high analytical sensitivity.

(2) Visualization System (Standard Configuration)

Figure 1: Visualization System



The first-of-its-kind multimedia graphite furnace visualization system in China provides an intuitive way to monitor the dynamic changes of the sample solution inside the graphite tube during drying, ashing, and burning processes. It allows easy observation of the optimal position and depth for the autosampler capillary needle insertion into the graphite tube, as well as the placement of the platform inside the graphite tube. This ensures analytical accuracy and extends the graphite tube's lifespan. Additionally, it serves as an excellent training tool.

(3) Graphite Furnace Controller (Standard Configuration)



Figure 2: Graphite Furnace Controller

The graphite furnace atomization device is an electrothermal atomizer that can increase the sensitivity of most metal elements from the mg/L level to the $\mu\text{g/L}$ level.

- **Advanced Optical Heating System:** Achieves automatic full-power heating during the atomization stage.
- **Heating Condition Settings:** Includes settings for drying, ashing, atomization, and two heating modes.

- **Heating and Temperature Control Methods:** Voltage feedback control during drying and ashing stages, and either voltage or optical feedback control during the atomization stage.
- **Typical Element Characteristic Concentrations:** Cd $\leq 0.4 \times 10^{-12}$ g; Cu $\leq 10 \times 10^{-12}$ g.

(4) Autosampler (Optional)

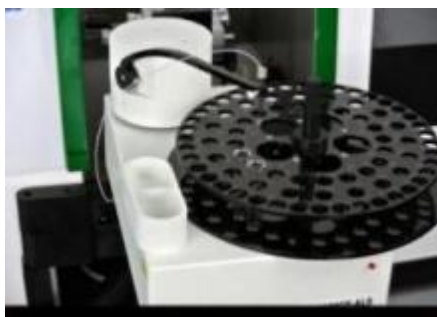


Figure 3: 85-Position Autosampler

- **Automatic Curve Function:** No need for manual configuration of calibration curves. A single standard solution is sufficient for automatic calibration curve configuration and measurement.
- **Intelligent Residue Removal Function:** Automatically detects and removes residues without manual intervention, eliminating cross-contamination.
- **Intelligent Dilution Function:** Fully automatic intelligent dilution. Based on sample concentration, the instrument automatically provides the dilution ratio, matches it to the optimal testing range, and completes the dilution and measurement process without any human intervention.
- **In-Tube Visualization System:** Monitors the injection and drying processes. During drying, every detail is visible, allowing for the quick and accurate determination of the ashing temperature.
- **Quality Control:** Intelligent and comprehensive analytical quality control technology, enabling periodic correction of blanks and quality control samples, monitoring result precision, and automatic retesting to ensure the quality of every analytical data point.

(5) Hydride Generator (Optional)



Figure 4: Hydride Generator

- **Essential Analytical Equipment:** Necessary for environmental monitoring, food hygiene, quality inspection, commercial inspection, and drinking water monitoring.
- **High Degree of Automation:** A single start button enables the entire process of sampling, generation, measurement, and cleaning with just a light press.
- **Unique Electrothermal Quartz Absorption Tube:** Compact device with rapid heating, easy installation, stable temperature, and a lifespan over ten times longer than flame heating.
- **Fuel-Free Operation:** Allows quick changes in analysis methods as soon as the temperature drops.
- **Advanced Flow Injection Technology:** Ensures more uniform sample reactions, enhancing the stability of the device with a relative standard deviation (RSD) of less than 2%.
- **Measurement Rate:** 100 times per hour with a single sample volume of less than 2 ml.