GTEK Laboratory
Atomic Absorption Spectrometer
AAS6000
Brochure

Description

AAS6000 Series are Single Beam Atomic Absorption Spectrometers controlled and data processed by external computer and internal CPU chips. AAS6000 can be used to measure the concentration of macro, micro and trace metal elements and half-metal elements in various kinds of substances.

Atomic absorption spectrometry is a technique exploiting the fact that atoms at ground state may absorb the radiation of characteristic wavelength. As is known, the atoms are usually at ground state. For each element, the amount of energy required for an atom to transit from ground state to excited state is specific, and in general, is called characteristic wavelength. The Atomic absorption spectrometry typically makes use of hollow cathode lamp as the light source to emit the characteristic wavelength of a particular element. When the light passes through the atomics vapor, it is absorbed by the vapor. The concentration of the element can then be determined through the calculation of the absorption rate.

AAS6000 is provided with three reading methods Continuum, Retention and Peak Height of measuring absorbency, density and emission intensity. It has three signal modes: Atomic Absorption, Background Absorption and Background Correction Absorption. The reading time ranges from 0.5s to 99s. AAS6000 include 8 computer controllable hollow cathode lamp holders. All working conditions of the instrument such as lamp number, lamp current, negative high voltage, working wavelength, slit, burner location, ignition/extinction and adjustment of burning ratio can be set by keyboard input. "The functions of the instrument include automatic gain automatic zero, background correction, automatic energy balance, automatic peak location/ wavelength scan, and automatic peak locationi on basis of the retrieval of peak values. All the readings, measurement results, calibration curves and operation conditions can be saved or printed out.

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Application fields

- ✧ Metallurgy, steel, non-ferrous metals,
- ✧ Environmental analyses: air, water quality, soil and solid wastes.
- ✧ Petrochemical engineering, crude oil and related products, light industrial products.
- ✧ Food, biomedicine and health products.
- ✧ Building materials (glass, ceramic, paints, etc).

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Technical specifications:

Model: AAS6000
Optical system: all-reflective single-beam CT optical path
Focal length of monochromator: 350mm, oil/water proof air compressor
Blazed wavelength of gratings: 230mm
Number of grating grooves: 1800g/mm
Wavelength range: 190nm-900nm
Wavelength accuracy: ±0.1nm
Wavelength repeatability: ±0.1nm
Spectrum bandwidth: 0.1/0.2nm/0.4nm/0.7nm/1.4nm
Noise: 0.005 Abs(Static); 0.006 Abs(Dynamic)
Baseline drift: 0.003 Abs/0.5h; best performance
Background correction: D2 lamp + self reversal
Number of the lamps: 8
Number of preload lamps: software controlled, ⩽8
Gas path safety measures: yes
Atomizer: flame atomizer
Automation: lamp/slit/wavelength/gas path/ignition/burner/protection/C2H2 monitoring

Atomic Absorption Spectrometer AAS6000	Periphery equipments	Main parts	Optional components	Power requirements	Gas
	PC (Brand computer, P4, LCD) 1 set Printer (Canon, colorful ink-jet printer) 1 set Air compressor 1 set	Narrow-line light source Gas control system Optical system Circuit control system	AC stabilized power supply Ultrasonic nebulizer Hydride generator	Single phase 220V±10%, 10A One switchboard （220V, 10A） is needed. The instrument should be within the 10m range of the switchboard, and earthed. Two plug boards （220V, 10A）	Purity of acetylene Navigation mark acetylene Usage of acetylene 1. 6L/min@0.2MPa

Advanced features:

- C2H2 monitoring; flame measurement; all reflective, aberration corrected.
- Fully automated instrument, total automatic operation.
- 8 element lamps, time saved for changing lamps.
- Gas path safety measures, safer operation.
- USB interface allows you to operate the instrument conveniently and rapidly.
- 230nm grating blazed wavelength, multiplied sensitivity in the Ultra violet zone.
- 1800g /mm grating grooves, maximized resolution.
- Run in Windows operating system, the powerful software enables automatic qualitative and quantitative analysis. Automatic report generation in Excel format allows you to operate the instrument and process the data easily. You operation doest get any easier with our graphical interfaces.

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Test example:

The following Figure is a test example of Pb content in liquid solvent taken with AAS6000 Atomic Absorption Spectrometer. With figurative interfaces and total automatic measurement, the instrument offers best test results. The advanced features of AAS6000 include: high sensitivity, low detection limit, good selectivity, uncompromised accuracy, simple operation, elemental range of 68 elements including both metals and non metals and organic chemicals.

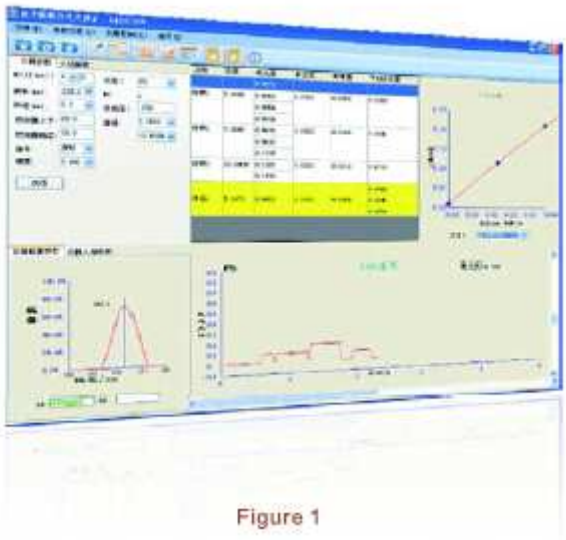


Figure 1

Figure 1 is good representation of the performances of AAS6000: good baseline stability, accurate wavelength peak location, powerful background correction, rapid, high efficient and precise analysis of liquid solvent, superior test results, intuitive display of instrument parameters, real-time absorbency and work curve, providing a better way to view the measurement results.

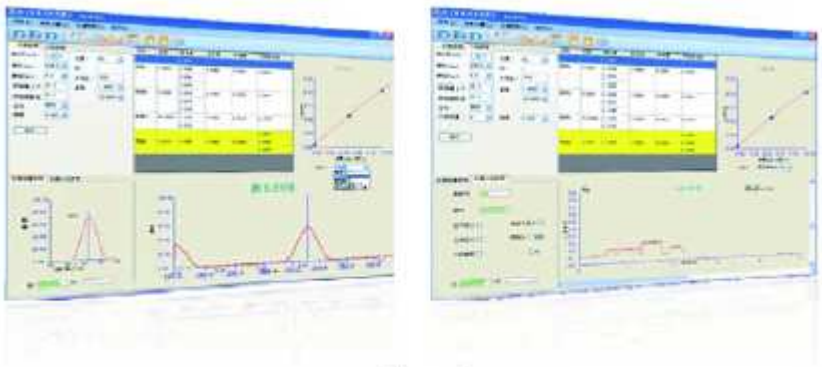
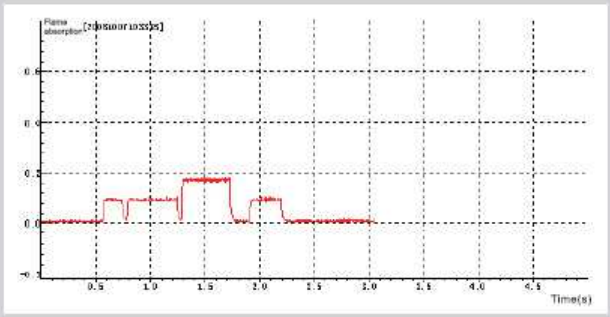
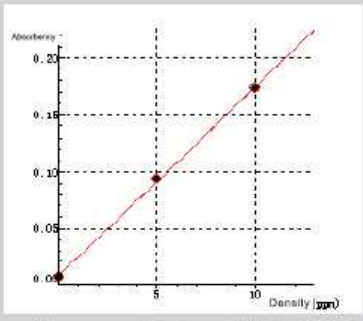


Figure 2

Figure 2 is energy spectrum, showing advanced features of our product as well: accurate wavelength, good repeatability, high resolution, intuitive display of instrument parameters and so on.

Note: As the hardware and software are in debug phase, the specifications of the instrument may be subject to changes without notice. Your kind understanding is highly appreciated.

Test report

	Element: Pb Method: flame absorption	Wavelength(nm): 283.30
Instrument parameters	Spectral bandwidth (nm): 0.2 Lamp current (mA): 3.00 Flame type: Nitrous oxide -acetylene Fuel gas pressure (MPa) :0.10 Support gas flow rate (L/min):5.00 Height of burner head (mm):20.0	Negative high voltage (V) :256 Background correction Fuel gas flow rate (L/min):1.60 Support gas: air Support gas pressure (MPa):0.20
Analysis parameters	Sampling speed: 50 Delay(s):0 Ruler extension (0.1-100) :1.00	Integral time(s) :1 Calculation method: peak height Flame micro sample introduction: no
Spectrum		 Linear correlated coefficient: 0.9996 Curve equation: Y=0.0166*X+0.0082

Analysis results

Name	Times	ABS	Density (ppm)	SD	RSD(%)	Results*
Standard 1	1	0.0074				
	2	0.0069				
	3	0.0064				
		0.0069	0.0000	0.00052	7.50411	
Standard 2	1	0.0949				
	2	0.0938				
	3	0.0935				
		0.0941	5.0000	0.00078	0.082395	
Standard 3	1	0.1748				
	2	0.1722				
	3	0.1730				
		0.1733	10.0000	0.00078	0.76521	
Sample 1	1	0.0962				
	2	0.0945				
	3	0.0950				
		0.0953	5.2470	0.00087	0.90879	5.25
Sample 2	1	0.0083				
	2	0.0097				
	3	0.0101				
		0.0094	0.0723	0.00091	9.66425	0.07