



**SCIGEN TEK**  
FOR YOU WITH YOU



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# **ATOMIC ABSORPTION SPECTROPHOTOMETER**

DESIGNED BY TECHKEY SOLUTIONS (OPC) PVT. LTD.

- High luminous flux total reflection dual beam splitting system with automatic single/dual beam switching
- Imported photomultiplier for more stable performance
- Highly automated and optimised adjustment system and reliable safety protection
- The vertical installed inline six-element lamp supports simultaneous lighting or preheating of all six lamps while maintaining the stability of the light path
- Fully self-developed, highly functional, intelligent and user-friendly software provides guarantee for experimental analysis

# ATOMIC ABSORPTION SPECTROPHOTOMETER

- 01 Very Low Stray Light and High Detection Sensitivity**  
Optimised 4th generation Czerny-turner type optical path design with 10% reduction in stray light.
- 02 High Luminous Flux**  
The fourth generation fully reflective dual-beam optical system, and the optical installation and coating technology have been upgraded to provide excellent optical performance with improved optical path stability and a 25% increase to luminous flux.
- 03 Integrated Design**  
The integrated design of the structure enables rapid automatic switching and positioning of the flame, graphite furnace and hydride generator atomizer without the need for human intervention.
- 04 Strong Adaptability**  
It can be adapted to imported graphite tubes, imported atomizers, and imported element lamps to meet higher testing requirements.
- 05 High Expandability**  
The possibility of equipping a flame and graphite furnace with a dual-use multifunctional autosampler AS2200, which can be switched between the two modes easily and quickly. Modular design: flame, graphite furnace and HVG-A modules can be configured at will. It is easy to add to the unit with changing the main unit.

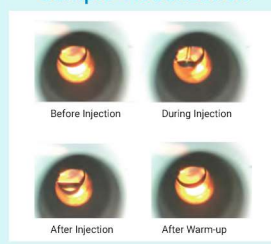


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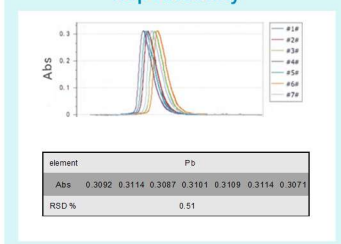
- 8-position lamp holder design for simultaneous lighting or preheating to meet the needs of more customers
- Newly developed software modules with a simple interface and a high degree of automation for better human-machine interaction;
- Graphite furnace visualization system - improves ease of autosampler commissioning and simultaneous monitoring of sample changes at each stage of temperature rise;
- Suspended autosampler, design for 3-second removal or installation; 100+8 position design for large numbers of sample
- Gas-activated graphite furnace control for easy tube replacement, airtight furnace design for high sample sensitivity;
- Wide linearity range to meet the needs of different industries;
- Optimized graphite furnace temperature control algorithm for better RSD of high-temperature elements (Al, Mo, V, Ti)



#### Sample Visualization



#### Repeatability



## NOVA8000 FLAME AND GRAPHITE FURNACE ATOMIC ABSORPTION SPECTROPHOTOMETER DUAL AUTOSAMPLE

### Flame-graphite Furnace Dual System

Solvent discharge method (Graphite Furnace), Solvent attraction method (Flame). Multiple liquid supply modes.

### Switching without Disassembly

Switching without disassembly, quick positioning, easy needle adjustment.

### In-line Dilution

Automatic addition of a wide range of matrix modifiers for single point in-line dilution configuration of standard curves;

### Powerful Functions

Single plate up to 50+5 sample positions with a minimum injection volume of 1 uL. It has the functions of origin detection, automatic cleaning, self-diagnosis, random programming and other operating functions.



## HVG-A HYDRIDE GENERATORS

- Combined with atomic absorption to detect elements that can generate gaseous hydrides, such as arsenic, mercury, selenium, antimony, bismuth, tin, tellurium, etc. High detection limit, good sensitivity and good stability.
- 10 adjustable sample flow rates, saving standard solution
- Continuous peristaltic pump injection (compared with pulsed) for signal stability and maximum elimination of memory effects.
- Compact electric heating quartz absorber tube, simple assembly with stable temperature.
- Independent external design, strong adaptability, and can be used in con-



## BASIC CONFIGURATION OF AAS

### FLAME ATOMIC ABSORPTION SPECTROPHOTOMETER

Flame AAS is suitable for the analysis of low and medium temperature elements, atomization temperature at room temperature -2200°C. The content of elements to be measured in the sample is generally analyzed in the ppm level (e.g. K, Ca, Na, Mg, Zn, Cu, Pb, Cd, Ni, Cr, Fe, Mn, Li, In, Pb, Pd...).

PS: K, Ca, Na, Mg, Zn (ppb level)

BASIC MAINFRAME	
MAIN COMPONENTS	Flame Atomisation Platform
	Flame Accessories
	Air Compressor
OPTIONS	Hollow Cathode Lamp
	Computer
	Printer

### GRAPHITE FURNACE ATOMIC ABSORPTION SPECTROPHOTOMETER

Suitable for the analysis of low and medium temperature elements, atomization temperature at room temperature - 3000°C. The content of elements to be measured in the sample is analyzed in the ppb level (e.g. Cu, Pb, Cd, Ni, Cr, Ag, Al, Mo, Ba).

BASIC MAINFRAME	
MAIN COMPONENTS	Flame Atomisation Platform
	Flame Accessories
	Graphite Furnace Atomisation Platform
	Graphite Furnaces Accessories
	Autosampler
	Air Compressor
OPTIONS	Cooling Circulating Water
	Hollow Cathode Lamp
	Computer
	Printer

### HVG-A ATOMIC ABSORPTION SPECTROPHOTOMETER

Suitable for the analysis of metal hydrides in some elements that can easily form gaseous states with hydrogen atoms. (e.g. As, Hg (cold atom method), Se, Sn, Bi, Sb).

BASIC MAINFRAME	
MAIN COMPONENTS	Flame Atomisation Platform
	Flame Accessories
	Hydride Generators
OPTIONS	Air Compressor
	Hollow Cathode Lamp
	Computer
	Printer

## APPLICATION CASES (SOME)

### ENVIRONMENTAL INDUSTRY

Chromium has a wide range of industrial uses, mainly in the metal processing, electroplating and tanning industries, and the wastewater and exhaust gases emitted from these industries are the main sources of pollution in the environment. Among them, hexavalent chromium is the most toxic and easily absorbed by the human body. It can invade the human body through digestion, respiratory tract, skin and mucous membranes, and is a carcinogenic hazard when exposed to or inhaled for a long or short period of time.

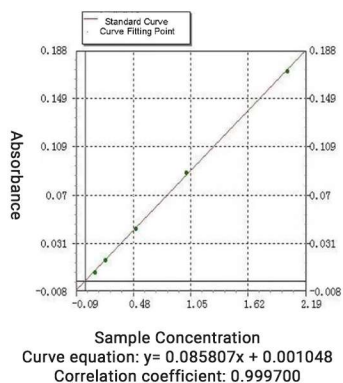
**Test Standard:** HJ 1082-2019

**Test Elements:** Determination of hexavalent chromium in soil sediments

**Test Instruments:** Flame Atomic Absorption Spectrophotometer

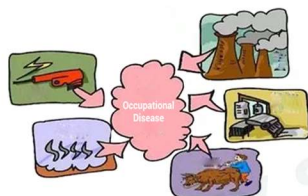


NO	STANDARD SOLUTIONS (mg/L)		
	0.2	0.5	1.0
1	0.2004	0.5064	1.0453
2	0.2008	0.5048	1.0517
3	0.2002	0.5026	1.0468
4	0.2001	0.5029	1.0411
5	0.2006	0.4998	1.052
6	0.1998	0.5011	1.0517
Average Value	0.2003	0.5029	1.0481
SD	0.0004	0.0024	0.0045
RSD	0.18	0.48	0.43



## CDC INDUSTRY

The sources of cadmium are food, water and air, so the pollution of soil and water by cadmium-containing waste can be harmful to human health. After being absorbed by mouth or respiratory tract and transferred to blood, most of it is concentrated in kidney and liver, and a small part is distributed in pancreas, thyroid, bile, testis and bone. Acute cadmium poisoning has symptoms such as acute gastroenteritis or acute chemical pneumonia and pulmonary edema.

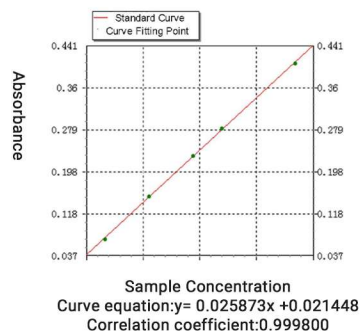


**Test Standard:** GBZIT 307.1-2018

**Test Elements:** Determination of cadmium in urine

**Instruments:** Graphite Furnace Atomic Absorption Spectrophotometer

NO	Standard Solutions (ug/L)	
	5	10
1	5.2567	10.1071
2	5.2326	10.1357
3	5.1780	10.0893
4	5.1488	9.9453
5	5.1221	9.9211
6	5.2110	9.8834
Average Value	5.1915	10.0137
SD	0.0513	0.1091
RSD (%)	0.9875	1.0899



## PHARMACEUTICAL INDUSTRY

Due to factors such as production process, concoction process and environment of origin, there will be Chinese herbs with excessive heavy metal content. When the heavy metals in herbs are super high, it will not only affect the medicinal value of the herbs, but also may cause some diseases, such as lead can damage human central nervous system, heart, brain and blood system; cadmium can be carcinogenic and teratogenic to human body; mercury can hurt its kidney or even fail; arsenic causes liver, kidney and heart function damage.

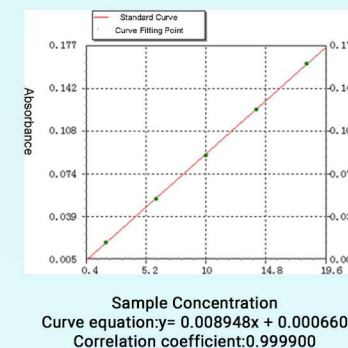


**Test Standard:** Pharmacopoeia

**Test Elements:** Chinese Herbs-Determination of Hg in Astragalus

**Instruments:** HVG-A Atomic Absorption Spectrophotometer

Elements	Hg
Lamp Number	6
Current	2 (mA)
Voltage	489 (V)
Spectral Bandwidth	0.4nm
Wavelength	253.7nm
Lighting Method	AA
Heating Method	HVG
Operation Method	Manual
Method Description	Hg_Astragalus2
Measurement Method	Standard Curve



## Fully Automatic Atomic Absorption Spectrophotometer (True Double beam)



### Features

- ✓ True Double Beam AAS Spectrophotometer
- ✓ Fully PC controlled system with software
- ✓ Stability: Double-beam optics automatically compensate the light source drift and wavelength drift caused by the variation of temperature (with the function of the eliminating the affection of wavelength drift on the base line stability) and electronic circuit drift so as to reach a good basic line stability.
- ✓ Quickly: The cathode lamp needs not be pre-heated for long time and sample can be analysed immediately for multiple kinds of elements and fast analysis of samples.
- ✓ High precision of measurement: Gas path system is equipped with precision pressure stabilizing and current stabilizing devices to reach stable flame and low noise. Specially designed fine light beam passes through the flame to ensure a high precision analytical test and low characteristic concentration.
- ✓ Long-life and anti-corrosive atomization system The burner is made of titanium alloys, anti-corrosive and fast thermal equilibrium. It meets the requirement of measurement sensitivity without water-cooling.
- ✓ Measuring Mode are Atomic Absorption, emission and concentration
- ✓ Greater than 0.9 abs for 5 mg/L copper solution with an RSD of less than 0.5% or better
- ✓ Motorized turret 8 Lamps equipped with lamp history function and log function
- ✓ Front-surfaced, refractive optics with protective coating for minimal loss of transmission
- ✓ System has the Auto Sampler available.

### Technical Specifications

Technical parameters	Model NOVA8000
Wavelength Range(nm)	
Linearity Error (%)	≤10
Wavelength error	±0.25nm
Wavelength repeatability	≤ 0.1nm
Wavelength range	(185~910) nm
Spectral bandwidth	Spectral bandwidth 0.1, 0.2, 0.4, 1.0, 2.0nm five automatically selectable.
Photometer	High luminous flux total reflection dual beam spectroscopy system, single beam / dual beam any automatic switching.
Baseline stability	Zero-point drift: ± 0.002Abs/30 min; transient noise: ≤ 0.0025Abs
Resolution	Mn 279.5 nm and 279.8 nm two spectral lines can be resolved, and the peak and valley energy values between the two lines should be less than ≤ 25% of the energy
Turning lamp holder	Eight-lamp position automatic conversion lamp holder, automatic collimation, six lamps can be preheated and lit at the same time.
Characteristic concentration (Cu)	0.03µg/ml/1%.
Monochromator	Czerny -Tuner
Detection limit	Flame method for copper measurement: ≤ 0.002 µg/mL
Repeatability	RSD ≤ 0.25 %.
Combustion head	Titanium metal combustion head.

Nebulizer	High-efficiency glass, stainless steel nebulizer.
Atomizing chamber	Explosion-proof and corrosion-resistant material atomizing chamber.
Detector	High sensitivity Photo-Multiplier Tube (PMT) detector
Background Correction	Flame: deuterium lamp background correction: can correct 1A background, greater than or equal to 60 times the correction capacity.
Data Processing	Measurement method: flame method, graphite furnace method Concentration calculation method: Standard curve method (1~2 times curve), auto-fit, standard addition method. Repeated measurement times: 1-99 times, calculate the average value, give standard deviation and relative standard deviation. Result printing: Parameter printing, data result printing, graphic printing.
<b>Autosampler</b>	
Function	Flame-graphite furnace dual use
Number of injection bits	Positive and negative 110 bits
Linearity	>0.999
Cross-contamination	<5×10 <sup>-5</sup>
Input volume	1-200uL
Repeatability of injection volume	<0.1%
Repeatability of results	<1.5%
<b>Gas flow control system controlled by MFC mass flow controller, with better than 1% accuracy in the full range.</b>	
Adjustment system: fully automatic PC control and adjustment of gas and combustion gas flow and burner position and angle, and automatic optimization, automatic ignition and identification of combustion head type.	
<b>Flame safety control: with a full set of safety interlock system, a variety of pressure monitoring, automatic safety protection function, acetylene leak detection. Burner type error, flame state, water seal, gas pressure, atomization system pressure, waste liquid bottle liquid level and other abnormalities can automatically extinguish the flame for protection. The gas circuit is equipped with a professional safety canister to ensure that the system shuts down in the</b>	
normal sequence in the event of an abnormality or power failure.	
Power requirements	220V (+10% ~ -10%), 50/60 Hz.
Ambient temperature	+10°C ~ +40°C.
Relative humidity	20 ~ 85%.

