



# SPECTROLAB

Spectrolab Science

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## Atomic Fluorescence Raleigh Series AFS

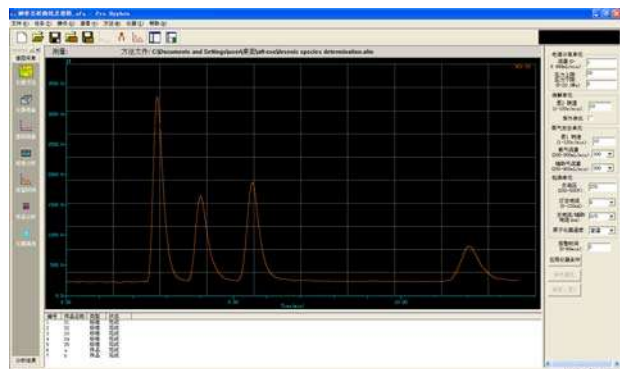
### AF-610D2 HPLC-VG-AFS Speciation Analyzer



- Low cost and perfect performance for speciation and total quantity analysis of heavy metal elements, .....comparable to ICP-MS.
- High automation speciation analysis, providing software control of the whole system (including HPLC separation)

#### Features:

- Comparable total amount analysis performance with ICP-MS:
  - Ultra-trace level (ng/mL) determination of As, Sb, Bi, Zn, Cd, Hg, Ge, Sn, Pb, Se and Te.
- Comparable speciation analysis performance with HPLC/IC-ICP-MS:
  - Ultra-trace level (ng/mL) speciation analysis of As, Sb, Hg, Se and Te.
  - Modular design for easy for operation and maintenance;
- Four functional modules include HPLC separation unit, UV digestion unit, vapour generation unit, and detection unit.
- Brand new Pro- Hyphen workstation software for both speciation analysis and total quantity analysis, providing control of the whole system (including HPLC separation) with a single software.





- Innovative and specially designed interface
  - Effectively reduces the peak broadening;
  - High inertia (PEEK) interface for most of reagents.



- Optimized UV digestion system, with long lifetime and high stability
  - Long lifetime (> 8000hours), low pressure mercury lamp;
  - High efficiency 254nm UV light source; 185nm UV light is blocked and no ozone is generated;
  - Fully sealed device for operator safety; Multi pass reflection greatly improves UV light utilization;
  - High precision temperature control system ensures high UV light output stability;
  - Low dead volume (0.8mL) reaction coil.

- Advanced gas-liquid separator, with higher S:N ratio
  - Comparable performance with Nafion drier;
  - Anti-foaming design, especially suitable for ion pair separation methods
  - Waste liquid auto drain design, no peristaltic pump required



- Low temperature atomization technique
  - Argon-hydrogen flame with auto ignition;
  - Stable temperature control system;
  - Very high stability atomization efficiency.

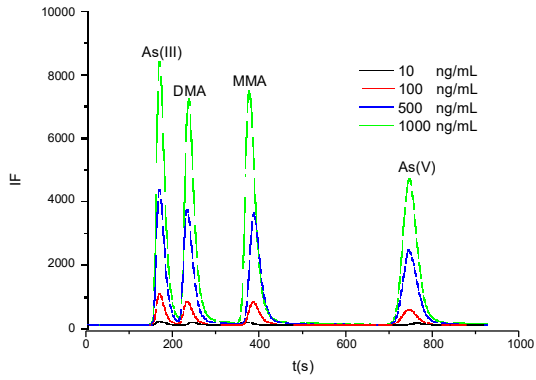
- Dual peristaltic pumps to deliver reagents with differing flow rates.
- High-efficiency mercury decontamination system to protect analyst's health.
- Three analytical modes can be selected freely through valve control
  - Total quantity analysis mode; Direct vapor generation mode; UV digestion mode.
  -

## Specifications

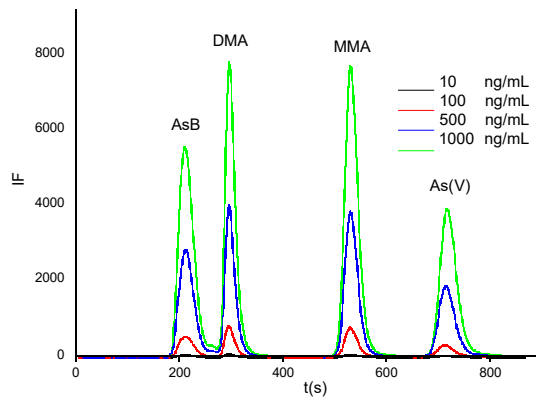
Detection Range		1. Speciation analysis of As, Hg and Se, etc. ; 2. Trace or ultra-trace analysis of 11 heavy metal elements, As, Hg, Se, Pb, Ge, Sn, Te, Bi, Sb, Cd, and Zn ; 3. Single element determination.
Working Environment		Power:220±22V, 50±2.5Hz; Temperature: 5~40°C; Relative humidity: 0 ~ 85%.
Detection Limit	Speciation Analysis	AsB<1ng/mL, As(III)<0.3ng/mL, DMA<0.4ng/mL, MMA<0.3ng/mL, As(V)<0.5ng/mL ;  Veterinary medicine containing arsenic: PASA<0.5ng/mL, NHPAA<0.5ng/mL, NPAA<0.5ng/mL; SeCys<1.5ng/mL, SeMeCys<2ng/mL, Se(IV)<1ng/mL, SeMet< 3ng/mL, Se(VI)<4ng/mL;  Hg ( II ) <0.1ng/mL, MeHg<0.2ng/mL, EtHg< 0.2ng/mL, PhHg< 0.4ng/mL ;  Sb(III) <0.5ng/mL, Sb(V) <1ng/mL; Te(IV) <2ng/mL, Te(VI) <5ng/mL.
	Total Amount Analysis	As、Sb、Bi、Se、Pb、Sn、Te <0.01μg/L; Cd、Hg <0.001μg/L; Ge <0.05μg/L; Zn <1.0μg/L.
Reproducibility	Speciation Analysis	<5.0%
	Total Amount Analysis	<1.0%
Linear Range		Better than three orders of magnitude

# Typical Chromatograms of Elemental Speciation By AF-610D2

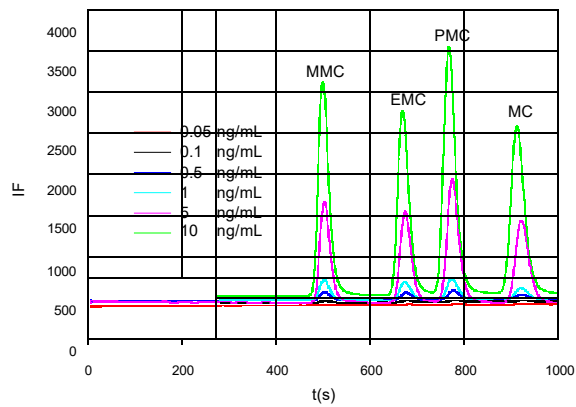
(1) As(III), DMA, MMA, As(V)



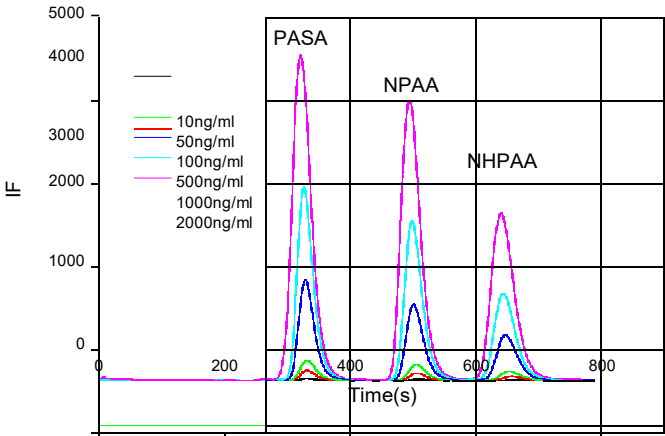
(2) AsB, DMA, MMA, As(V)



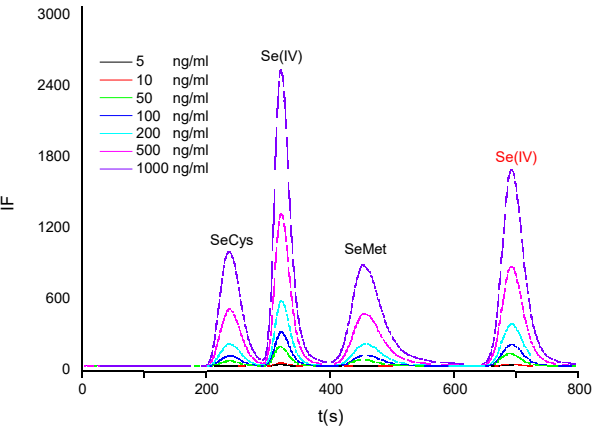
(3) MMC, EMC, PMC, MC



(4) PASA, NPAA, NHPAA



(5) SeCys, Se(IV), SeMet, Se(VI)



# AF-610E/630A/640A Atomic Fluorescence Spectrometer



- Ultra trace level (ng/mL) determination of As, Sb, Bi, Zn, Cd, Hg, Ge, Sn, Pb, Se and Te.
- AF-610E is a single channel AFS. AFS-640A is a double-channel AFS, which can analyze two elements simultaneously. AFS-630A is a triple-channel AFS, which can analyze three elements simultaneously.
- Upgradable to atomic fluorescence speciation analyzer, adding HPLC pump and PDI-10 UV digestion device .
- Especially suitable for geologic samples, simultaneous analysis of As, Sb & Bi (AF-630A).

## Features:

- Light Source System
  - Single-cathode or double-cathode hollow cathode lamp can be used as the light source.
  - Pulse power supply mode for higher stability and lower drift.
  - Main current and auxiliary current of double-cathode HCL are automatically matched by PC.
- Optical System
  - Short focal length, non-dispersive optics with closed light optical system
- Advanced gas-liquid separator, with high signal-to-noise ratio
  - Comparable performance with Nafion drier;
  - Anti-foaming design, especially suitable for ion pair separation methods;
  - Waste liquid auto drain design, no peristaltic pump is necessary.
- Low temperature atomization technique
  - Argon-hydrogen flame with auto ignition;
  - Stable temperature control system;
  - Very high stability atomization efficiency.
- Long life (3 years) and high efficiency (70%) active and recycling mercury trap

- Powerful function and upgrading capability
  - Adding PDI-10 UV digestion device and work station, and coupled with chromatographs allows speciation analysis of As, Hg, and Se.
  - Adding WM-10 Ultra-trace Hg determination device to determine directly the ultra-trace Hg in water samples such as surface water, sea water, tap water and spring water, etc.
  - Adding VM-10 Gaseous Hg determination device to determine directly the ultra-trace Hg in gas sample of air, natural gas, laboratory and working environment, etc.
  - Two kinds of autosamplers available for fully automatic operation.



VM-10 Gaseous Hg Determination Device



WM-10 Ultra-trace Hg Determination Device



AS-10 Autosampler



AS-20 Autosampler

Analytical Results of GSD(sediment) and GSS(soil) Certified Reference Materials (CRM) by AF-630A

CRM		As (µg/g)			Sb (µg/g)				
		results	Average	Certified result	results	Average	Certified result	results	A
GSD-2	GSD-2-1	5.53	5.6	5.3~7.1	0.42	0.41	0.29~0.63	1.62	
	GSD-2-2	5.57			0.41			1.66	
	GSD-2-3	5.82			0.41			1.59	
GSD-3	GSD-3-1	15.11	15.4	14.6~20.6	4.75	4.83	4.6~6.2	0.70	
	GSD-3-2	15.56			4.82			0.72	
	GSD-3-3	15.44			4.93			0.69	
GSD-4	GSD-4-1	18.83	18.7	17.1~22.3	1.70	1.83	1.57~2.11	0.54	
	GSD-4-2	19.00			1.87			0.56	
	GSD-4-3	18.22			1.93			0.51	
GSD-6	GSD-6-1	12.42	12.6	12.1~15.1	1.06	1.06	0.92~1.58	4.81	
	GSD-6-2	12.44			1.05			4.92	
	GSD-6-3	12.93			1.08			4.76	
GSS-1	GSS-1-1	34.59	34.7	31.8~35.2	0.84	0.85	0.75~0.99	1.18	
	GSS-1-2	34.91			0.87			1.15	
	GSS-1-3	34.66			0.84			1.20	



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