Aurora
ILLUMINATING SOLUTIONS

Element Speciation Analysis
HPLC - Atomic Fluorescence Spectrometer

An integrated AFS-HPLC finds its applications across diverse fields like food, health, epidemic prevention, commercial inspection, agriculture, drug testing and for scientific research. The AFS exhibits ultra-high sensitivity with detection limits as low as ng/L (solutions) or ng/g (solids). An added advantage is that AFS allows for prolonged usage making it an excellent candidate for HPLC coupling. The AFS-HPLC can be effectively used for speciation analysis, or quantifying ultra-trace concentrations of different molecular versions of the same compound.

Mercury in biological materials can exist in both inorganic and organic forms. The most commonly found compound of mercury is Methylmercury ($MeHg^{+}$). $MeHg^{+}$ can enter the environment either directly from industrial emissions or via biomethylation of inorganic mercury. $MeHg^{+}$ accumulates in the nutrition chain and can reach substantial concentrations in the muscle tissue of predatory fish, for example. AFS-HPLC can be used in speciation studies for detection and quantification of compounds containing Hg and other hydride forming elements, making it valuable for environmental applications.

For elements that exist in several oxidation states, the tendency to form complexes and its adsorption is very different. The adsorption tendency depends on factors such as temperature, pH of the system etc. This offers the possibility for selective determination of each oxidation state. Species with highest toxicity (As^{3+}, Se^{4+}, etc.) forms the most stable complexes with DDTC and can thus be determined directly via sorbent extraction with C18, thereby allowing speciation analysis.

LC-LUMINA 3600

Features

High pressure infusion pump

Suitable for C18 column - For Hg morphological analysis

Suitable for PRP-X100 anion chromatography column - For As morphologic analysis

On-line digestion device - Ultraviolet digestion lamp of quartz tube improves efficiency of digestion

Six channel peristaltic pump and two pressure tube clamp regulating continuous sampling system - Reduces signal drift and liquid phase interference, and improves signal to noise ratio

Atomizer
- Vapour hydride generator
- Double layer quartz tube
- Argon hydrogen flame automatic ignition
- High efficiency multistage reaction mixer
- Two stage gas-liquid separator

Dual channel detection system of the lamp holder
- Determination of one element or two elements simultaneously
- Improves detection efficiency and reduces sample consumption

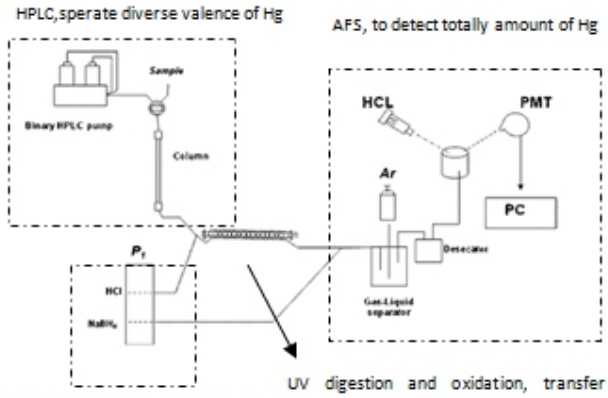
Short focal length non dispersive optical system,
- Integrated sealing, increases fluorescence reflection, reduces light interference
- Improves sensitivity and precision

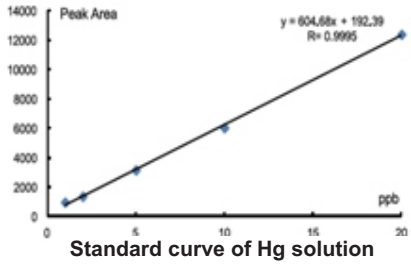
Optional autosampler

Data Processing Software
- Powerful spectrum processing function
- Simple and convenient operation

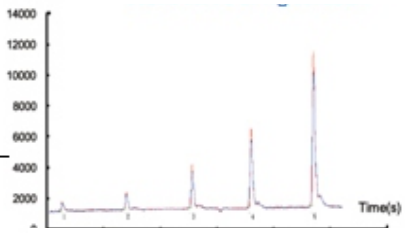
Qualitative & Quantitative Analysis

Speciation		Minimum	Analysis	Accuracy	Linear	R^2
As	As(III)	0.04	<10	<5%	10^3	>0.999
	DMA					
	MMA	0.08				
	As(II)	0.2				
Hg	Hg(II)		<12			
	MeHg					
	EtHg					
	PhHg	0.1				
Se	SeCys		<10			
	SeMeCys	1				
	Se(IV)	0.1				
	SeMet	2				
Sb	Sb(V)		<10			
	Sb(III)					



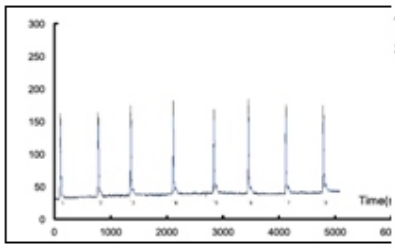


Standard curve of Hg solution



Test spectrogram of Hg solution

num	Peak area
1	606
2	1011
3	1056
4	1062
5	1062
6	1076
7	1066
8	1059
SD	30.69
RSD	2.92%



1ppb, 2ppb, 5ppb, 10ppb, 20ppb.
y= 604.68x+192.39, R=0.9995

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