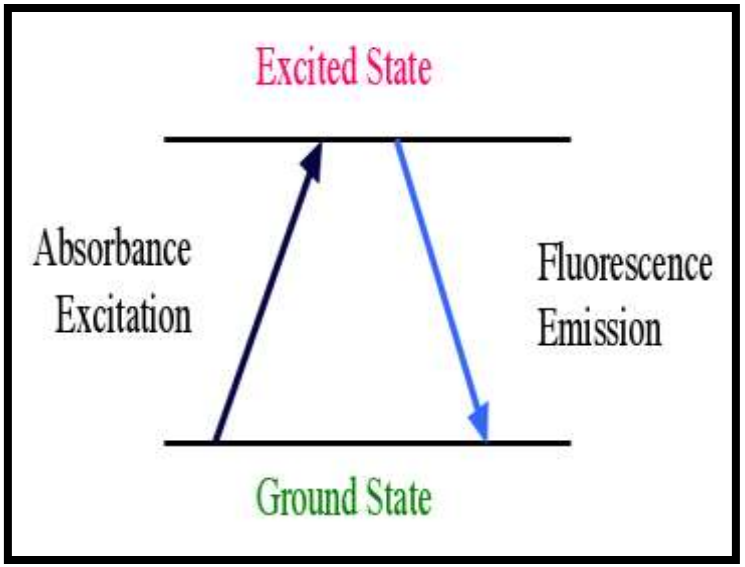
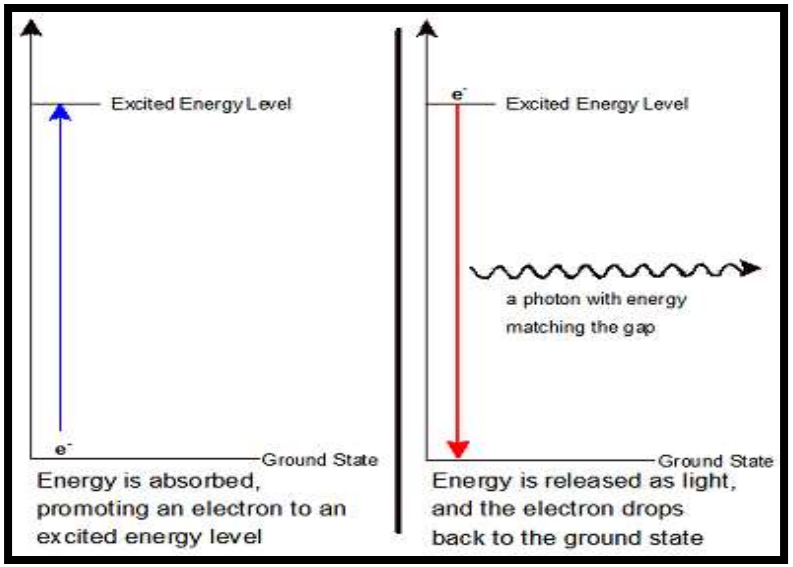
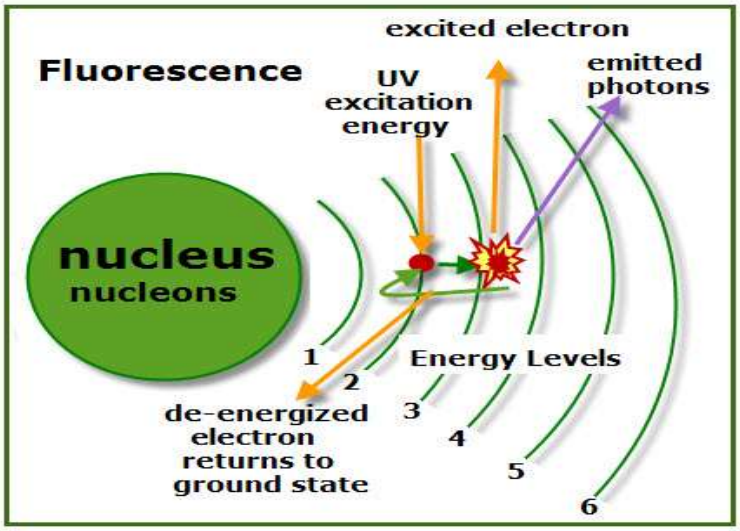
The Process of AFS

Stage 2. The radiation at 254nm is absorbed by any analyte mercury atoms and is emitted as fluorescence at 254nm also.





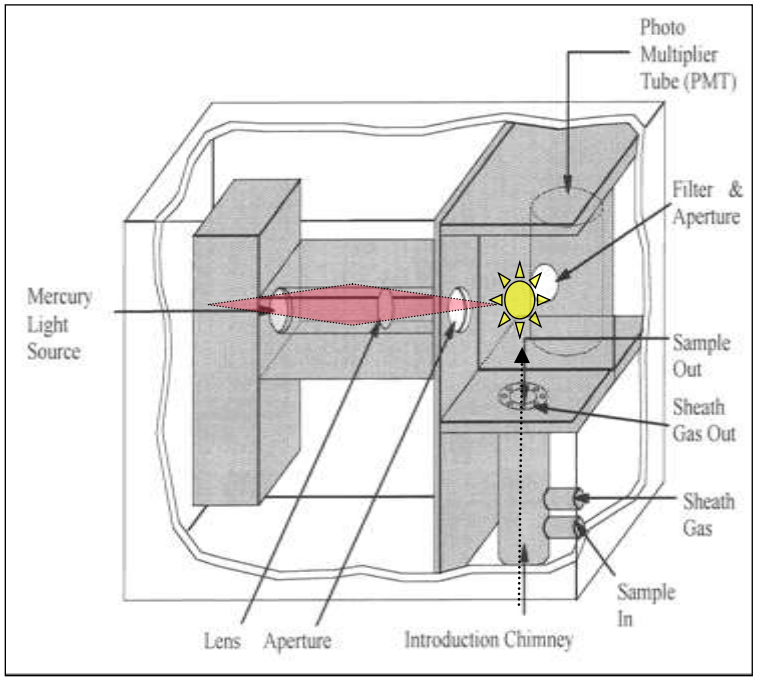


Element Specific Selectivity

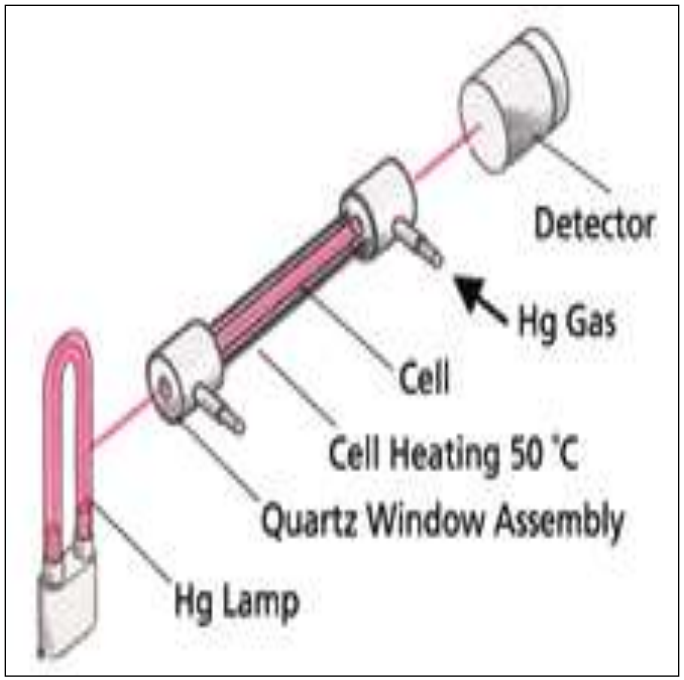
PSA

AFS - How do we capture the emitted photons? The importance of detector design – measurement at 90°

AFS



AAS



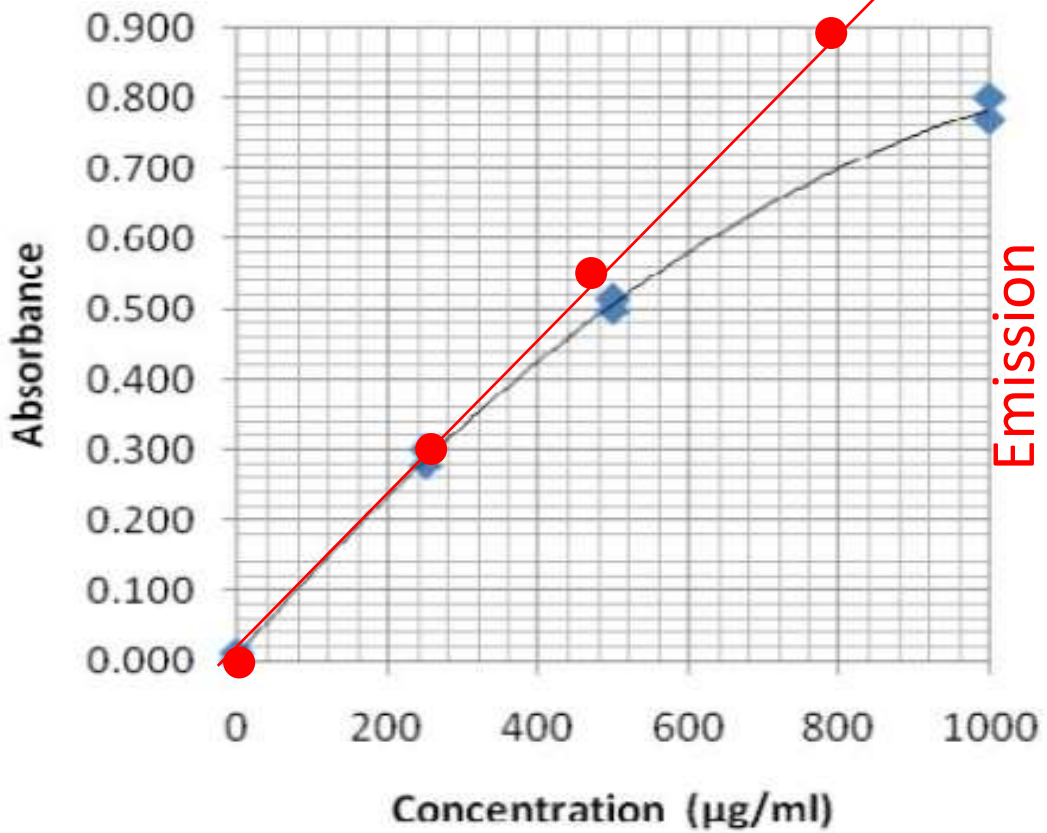
Emission v Absorption

	Emission Technique AFS/ICP	Absorption Technique AAS/GF
Standby (Background)		
Analysis (Signal)		

Great sensitivity

PSA

Linearity



Emission techniques such as AFS

Emission

Several orders of magnitude linearity

PSA

Interferences

- Spectral (polyatomic - isobaric)
- Contamination and Carryover
  (memory effects)

Spectral interferences

The Achilles heal of ICP-MS?

Consider Arsenic and Selenium

Table 1. **Common ICP-MS interferences.**

Polyatomic Species	Interfered Analyte
$^{40}Ar^{35}Cl$	^{75}As
ArAr	^{80}Se

Arsenic	^{75}As 100%
Selenium	^{74}Se 0.89%
	^{76}Se 9.37%
	^{77}Se 7.63%
	^{78}Se 23.77%
	^{80}Se 49.61%
	^{82}Se 8.73%

Choose another isotope?

Use a high resolution MS?

Use He as a Plasma gas?

Use a collision cell?

There are no such interferences for AFS

PSA

Contamination and Carryover (memory effects)

- Hg is notorious for causing carry over problems – Sticks to most surfaces – Care is required.
- A major problem is the presence of glassware within the instrumentation
  - Spray chamber, nebuliser, flow cells

PSA – AFS – Patented Argon shield flow cell

PSA