

Friday Worksheet
UV-visible and AA Spectroscopy 1

Name:

- 1) A sample of fish, caught from the bay, was to be analysed for mercury content. It is to be analysed by atomic absorption spectroscopy. Place the following in order so as to make a viable analysis procedure. Some steps may not need to be used.
- | | |
|---|----------|
| a) Prepare standard solutions of mercury. | c) a) |
| b) Filter the sample of crushed, dissolved fish. | b) e) |
| c) Measure an accurate mass of fish sample. | i) c) |
| d) Refer the absorbance reading to the calibration curve to obtain the concentration. | k) b) |
| e) Construct a calibration curve. | f) or i) |
| f) Dilute the filtrate using a volumetric flask. | j) k) |
| g) Measure the absorbance of the sample using a Hg cathode lamp. | j) k) |
| h) Titrate with a burette until the end point is reached. | g) f) |
| i) Dissolve the crushed sample in an appropriate acid solution. | g) f) |
| j) Take a small sample of the diluted solution and place it in the AAS. | a) j) |
| k) Wash residue. | a) j) |

A calibration curve can be constructed at any time as it is shown prior to obtaining the concentration.

- e) g)
d) d)

- 2) Consider the diagram on the right of an atom.

- a) Indicate which particles take part in forming an:

- emission spectrum.

valence electrons

- absorption spectrum

valence electrons

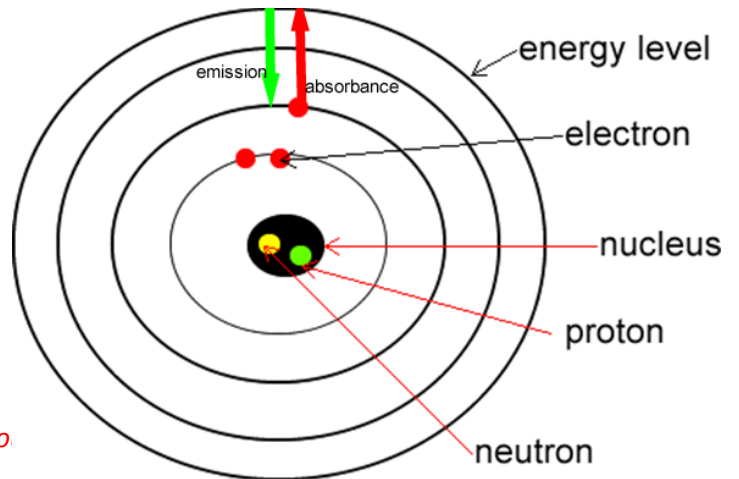
- b) Clearly indicate on the diagram the behaviour of the particle in forming an:

- emission spectrum

Electron returns from excited state to ground state

- absorption spectrum.

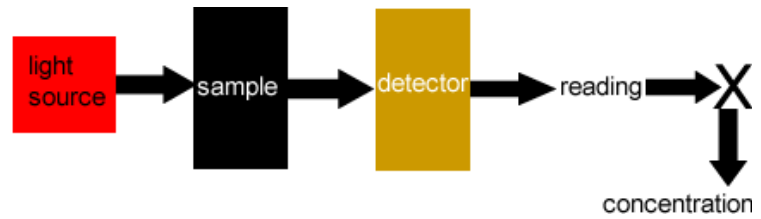
Electron moves from ground state to excited state



3) Below is a diagram that loosely fits UV-Visible spectroscopy and atomic absorption spectroscopy.

a) Indicate on the diagram what difference makes AAS a more sensitive procedure than UV-?

The wavelength of light in an AAS is specific to Hg. Unlike UV which uses a band of wavelength absorbed by Hg.



b) X is common to both procedures. Indicate what it could represent.

Calibration curve.