

**Atomic Absorption Spectroscopy,
Atomic Emission Spectrophotometry ...**

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ILOs:

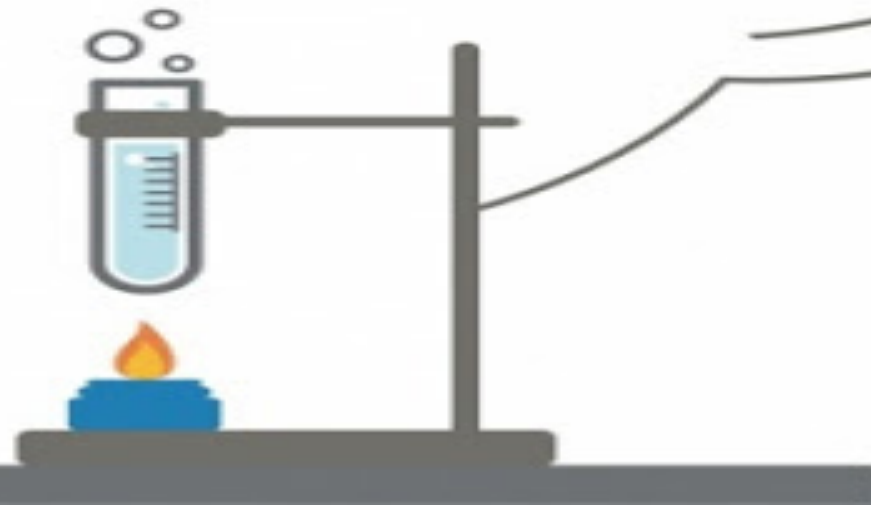
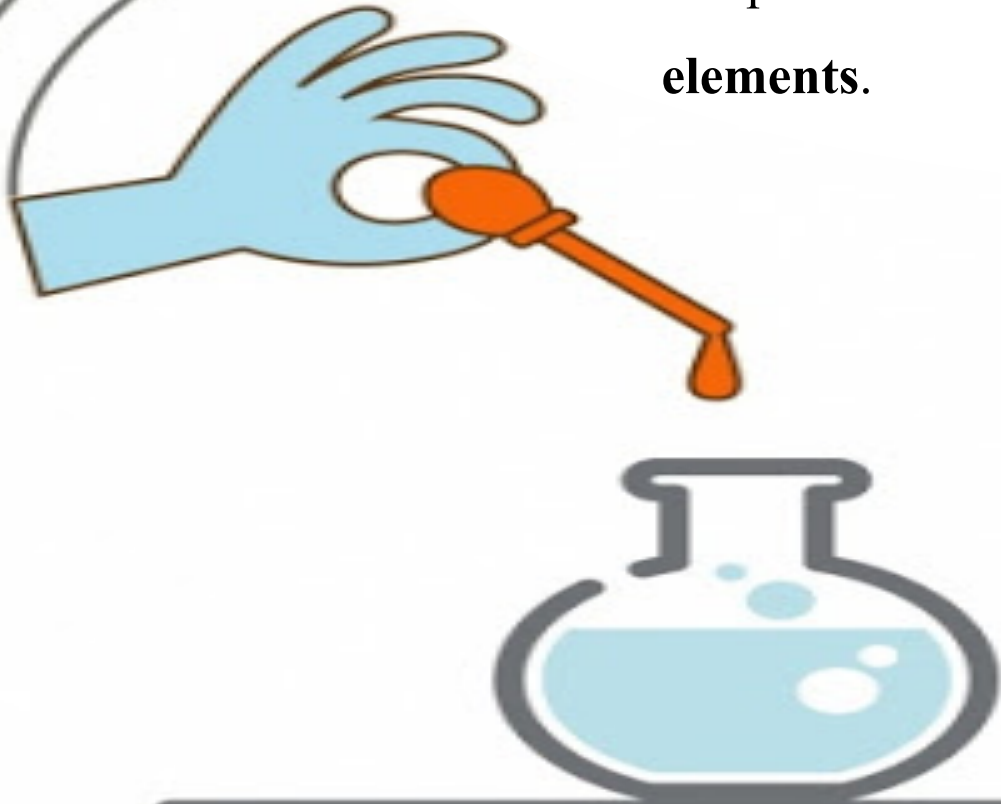
- ❖ Define Atomic absorption spectroscopy (AAS) and atomic emission spectroscopy (AES)
- ❖ List advantage and disadvantage of (AAS) & (AES) .
- ❖ Compare between (AAS) & (AES).





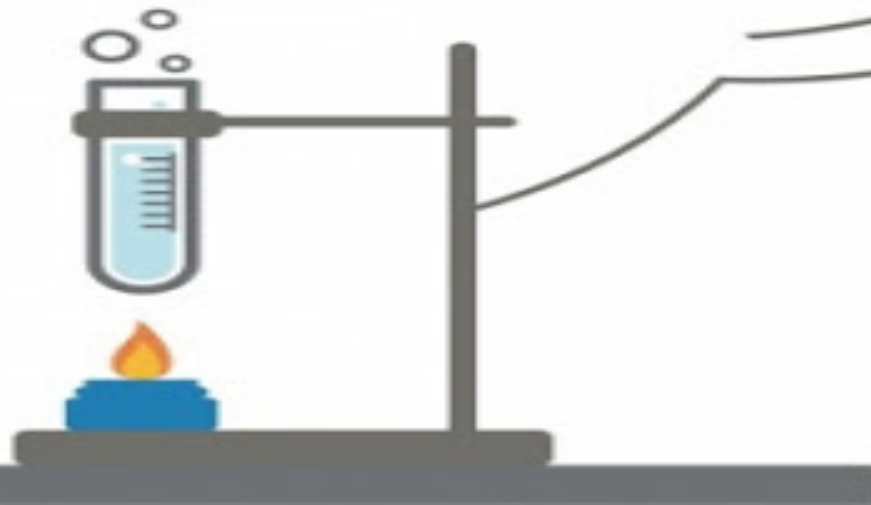
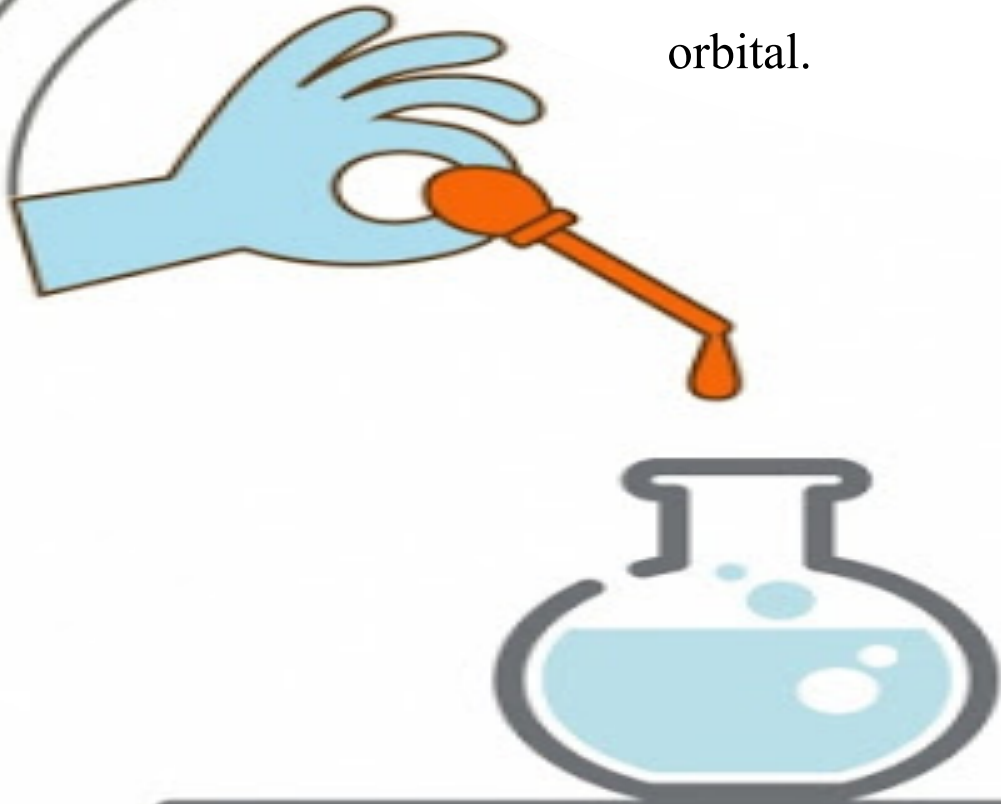
Introduction

Atomic absorption spectroscopy (AAS) and atomic emission spectroscopy (AES): is a spectroanalytical procedure for the quantitative determination of chemical elements, because, Both method use atomization of a sample and therefore determine the **concentration of elements.**



(AAS): absorption of a photon results in atomization of an electron from a lower to higher energy atomic orbital,

(AES): atomization the electron from a lower to higher energy orbital ; BUT when the excited electron returns to its original orbital.





Advantage and disadvantage

AAS

```
graph TD; AAS([AAS]) --> Advantage[Advantage]; AAS --> Disadvantage[disadvantage]; Advantage --- AdvList[➤ Easy to use  
➤ Good precision  
➤ High sample throughput  
➤ Cheap]; Disadvantage --- DisList[➤ Sample must be in solution  
➤ Require large sample size  
➤ Lack of sensitivity  
➤ ONLY for metallic elements];
```

The diagram features a central oval labeled 'AAS' at the top. Two arrows point downwards from this oval to two rounded rectangular boxes: 'Advantage' on the left and 'disadvantage' on the right. Below the 'Advantage' box is a list of four bullet points. Below the 'disadvantage' box is a list of four bullet points. The background is light green with a dark red decorative shape on the left side.

Advantage

- Easy to use
- Good precision
- High sample throughput
- Cheap

disadvantage

- Sample must be in solution
- Require large sample size
- Lack of sensitivity
- ONLY for metallic elements

AES

```
graph TD; AES([AES]) --> Advantage[Advantage]; AES --> Disadvantage[disadvantage]; Advantage --- AdvList[Small sample size, Little or no sample preparation required, Direct analysis of solid sample]; Disadvantage --- DisList[Loss of analyte during ashing stage, Incomplete atomization, Used for alkali and some alkaline earth metals.];
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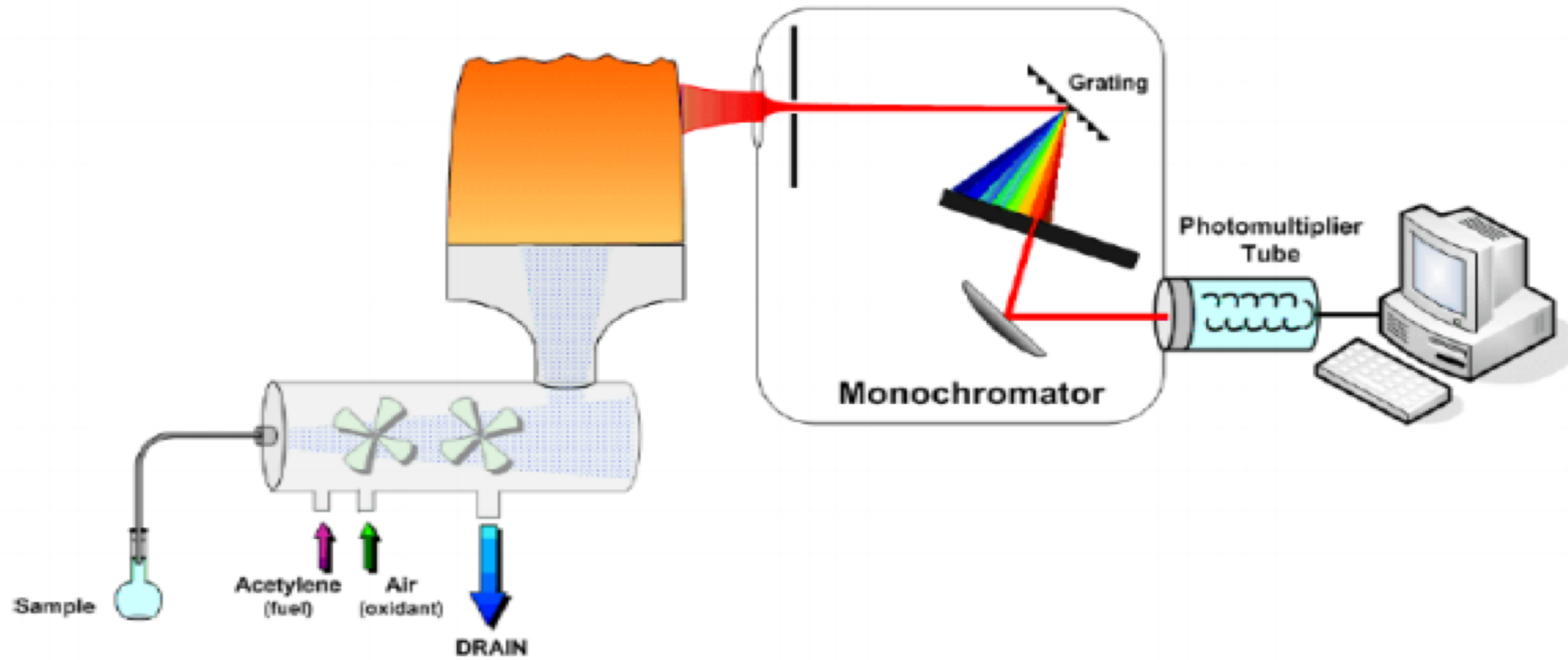
Advantage

- Small sample size
- Little or no sample preparation required
- Direct analysis of solid sample

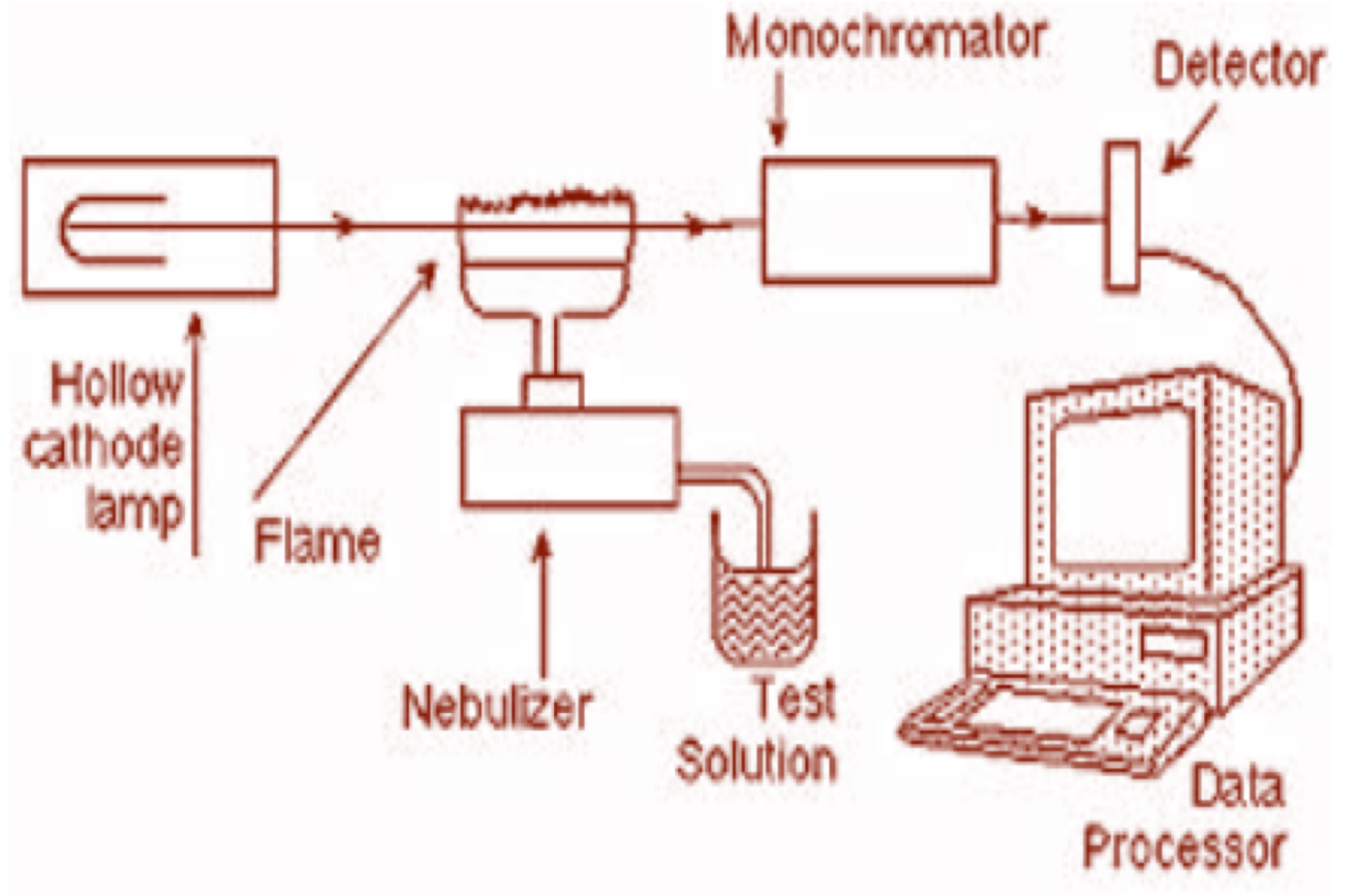
disadvantage

- Loss of analyte during ashing stage
- Incomplete atomization
- Used for alkali and some alkaline earth metals.

Atomic Emission Spectroscopy



Atomic Absorption spectroscopy





Question

What is the function of the monochromator
????

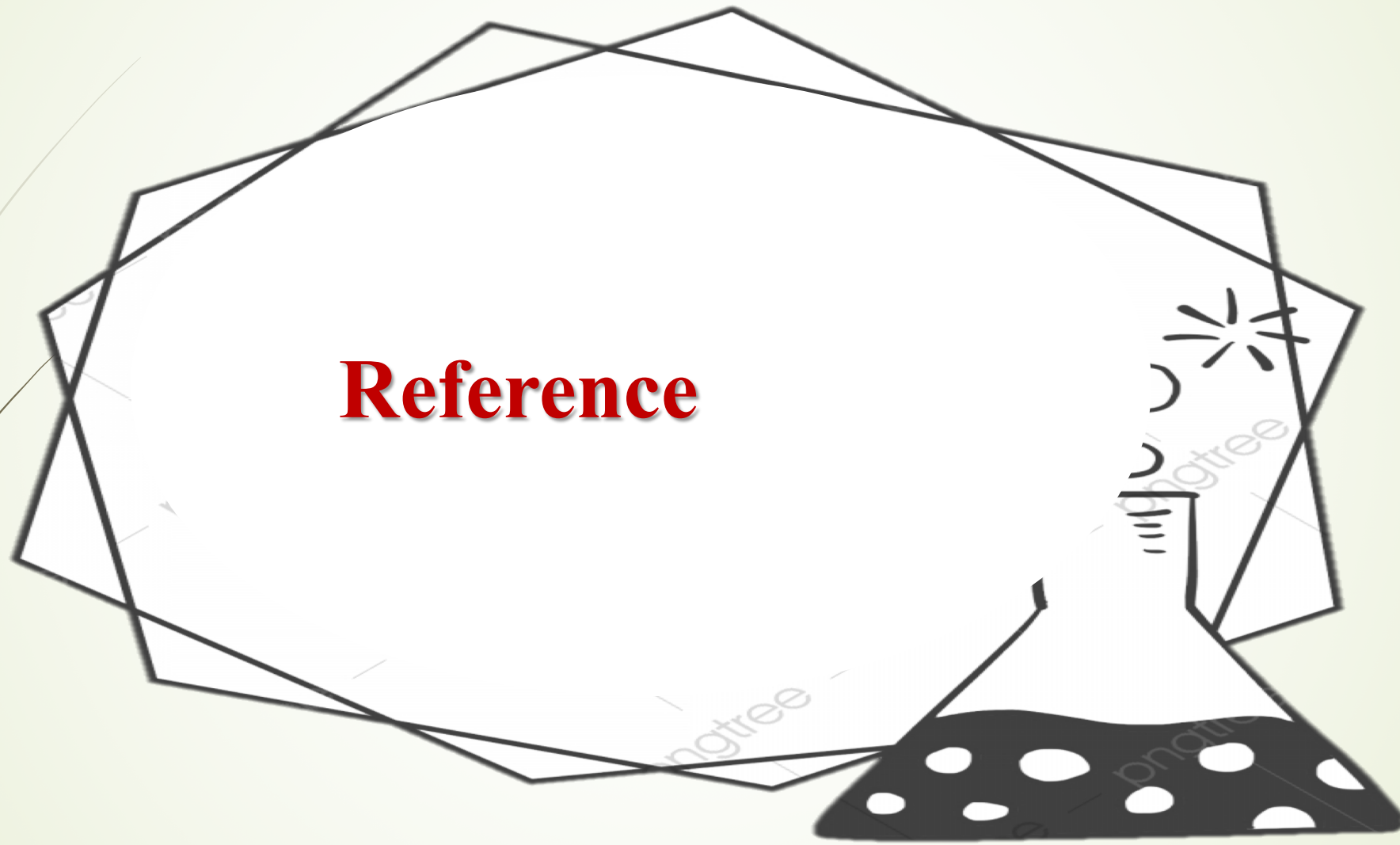


**comparison between
(AAS)&(AES)**



Comparison btw AAS & AES (Based on Flame)

	Flame Atomic Absorption	Flame Atomic Emission
Process measured	Absorption (light absorbed by unexcited atoms in flame)	Emission (light emitted by excited atoms in a flame)
Use of flame	Atomization	Atomization & excitation
Instrumentation	Light source	No light source
Beer's Law	Applicable	Not applicable



Reference

- Ref:
- https://www.google.com/search?q=compare+between+atomic+spectrophotometry+and+atomic+absorption&source=lnms&tbm=isch&sa=X&ved=2ahUKewj96Nv01PDsAhVIzBoKHUCFDycQ_AUoAXoECBUQAw&biw=1366&bih=657
- <https://www.google.com/search?q=difference+between+aas+and+aes&tbm=isch&hl=en-US&sa=X&ved=2ahUKEwj4z5ah2vDsAhWE76QKHfYpDgYQrNwCKAB6BQgBEIsC&biw=1349&bih=657#imgrc=IRP7iZ1rZkSUtM>

Thanks!

