

SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

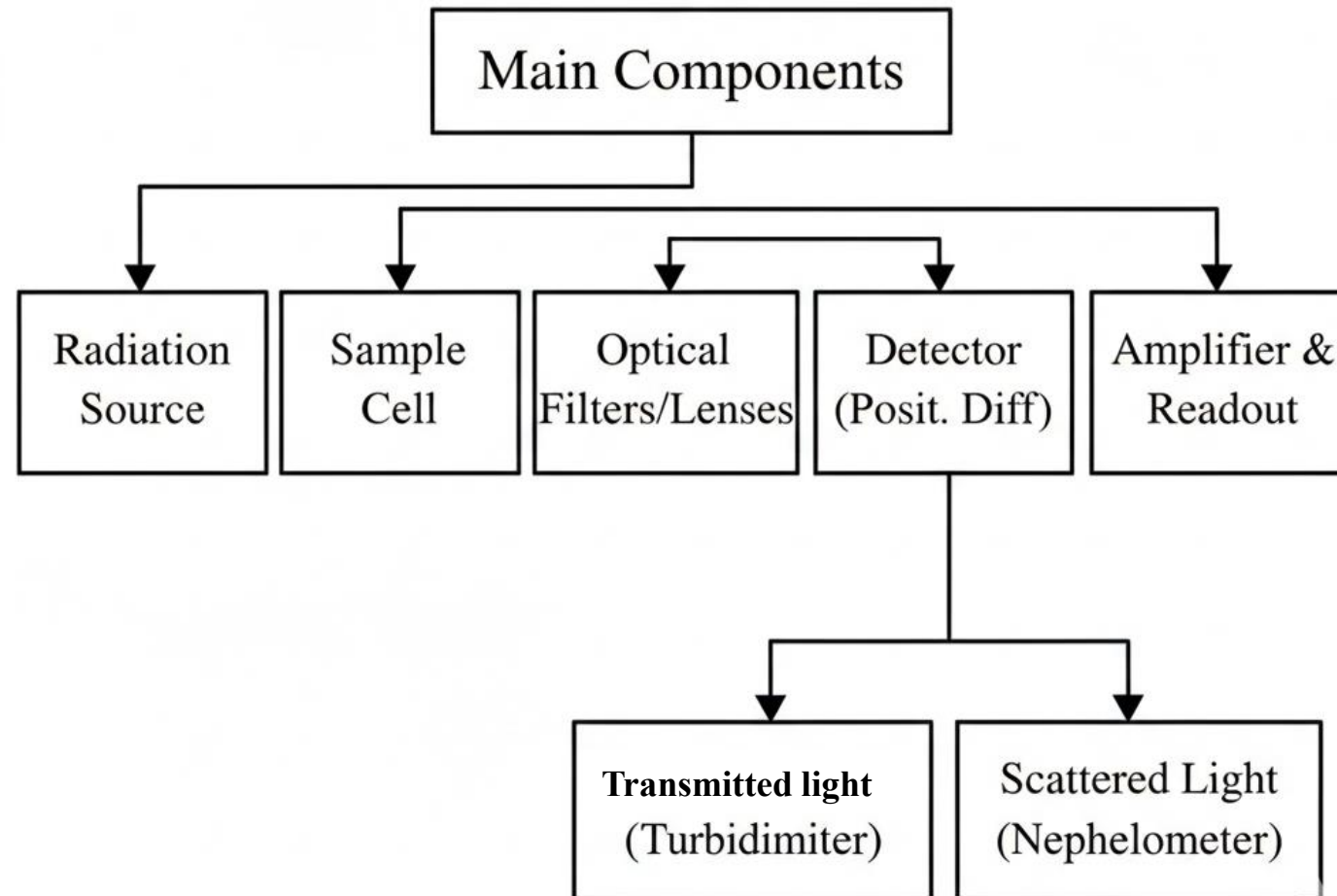
Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai
Approved by Pharmacy Council of India, New Delhi.
Coimbatore -641035

COURSE NAME: INSTRUMENTAL METHODS OF ANALYSIS (BP 701 T)

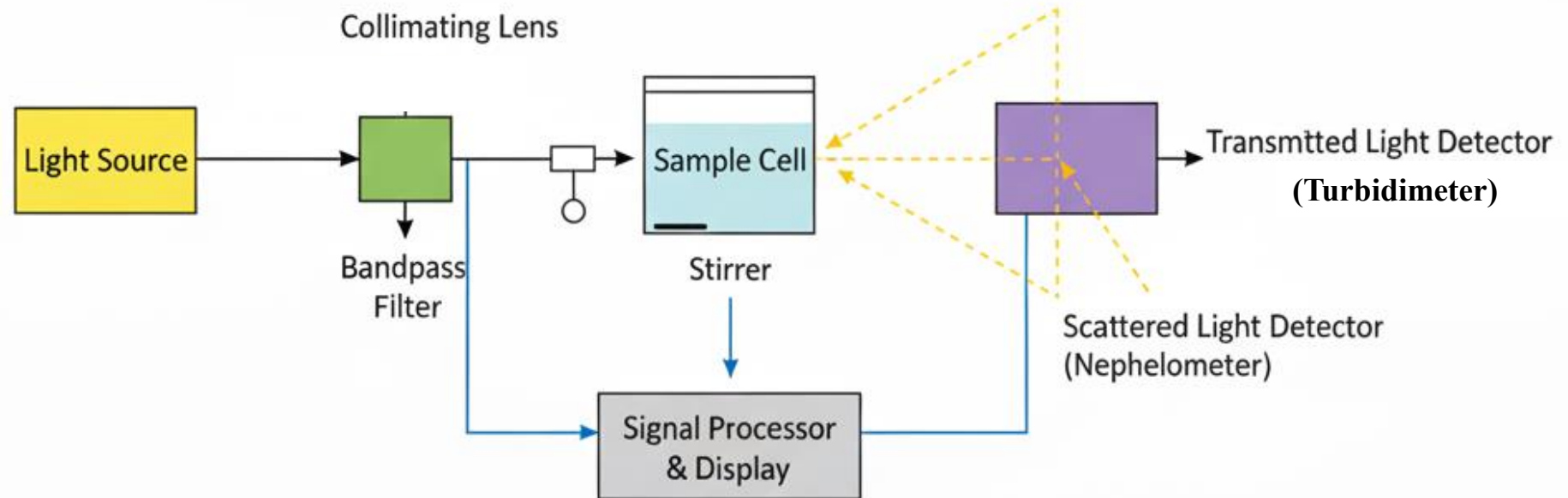
VII SEM/ IV YEAR

TOPIC 20: INSTRUMENTATION OF NEPHELOTURBIDOMETER

MINDMAP:



Schematic representation



Radiation Sources

Commonly Used:

Tungsten filament lamp



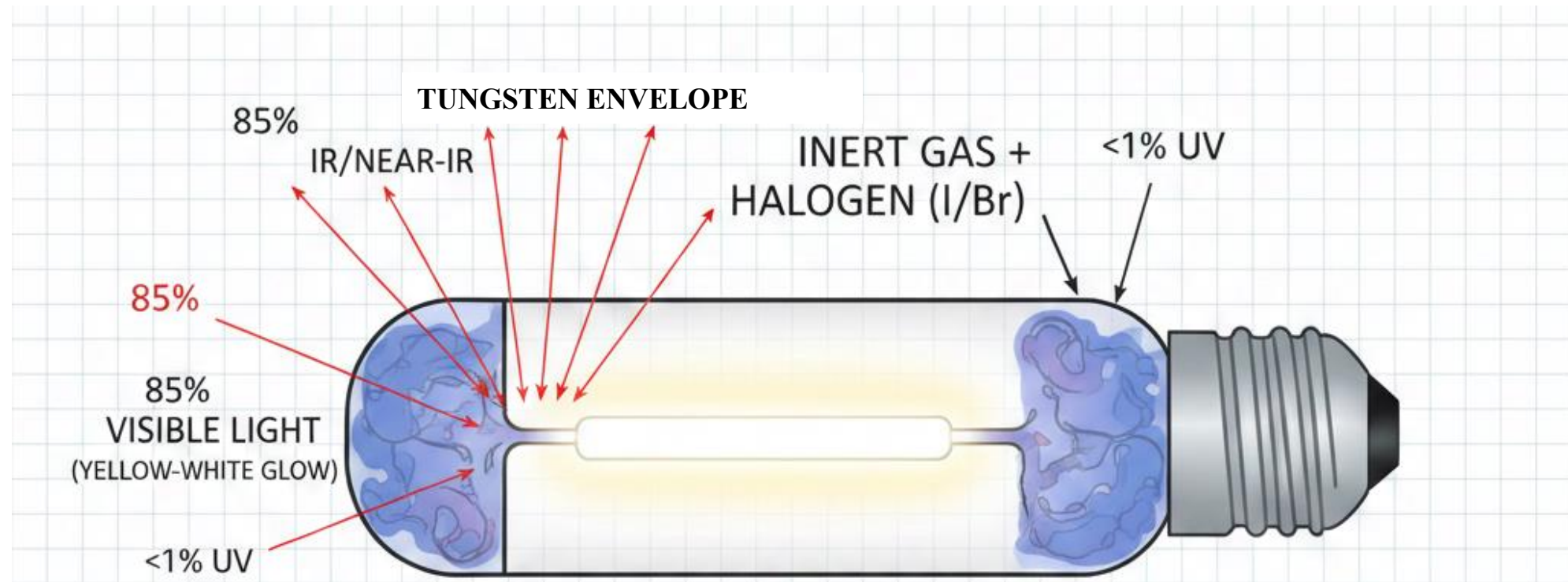
Visible Range,
Stable, Intense,
Continuous

Alternative:
Mercury Arc Lamp

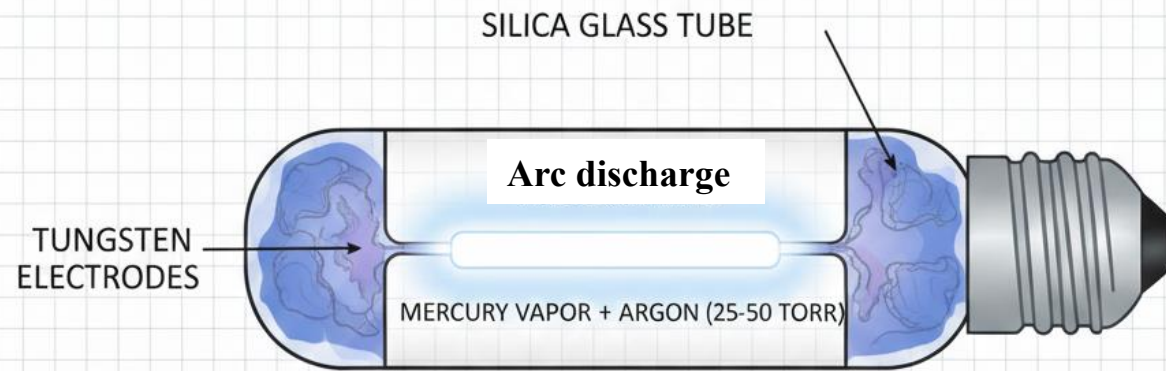


Specific
Wavelengths (UV)

Tungsten Halogen Lamp

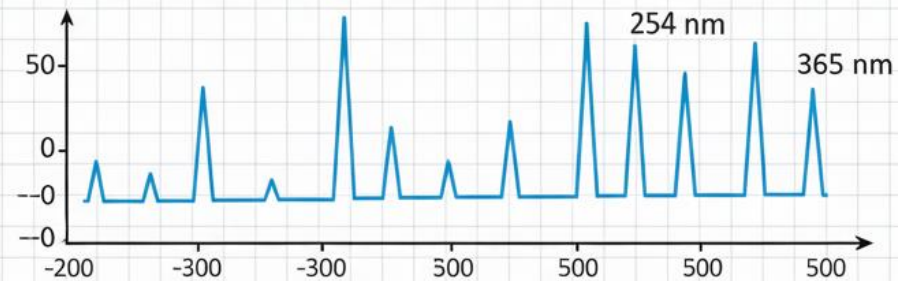


Mercury Vapor Lamp



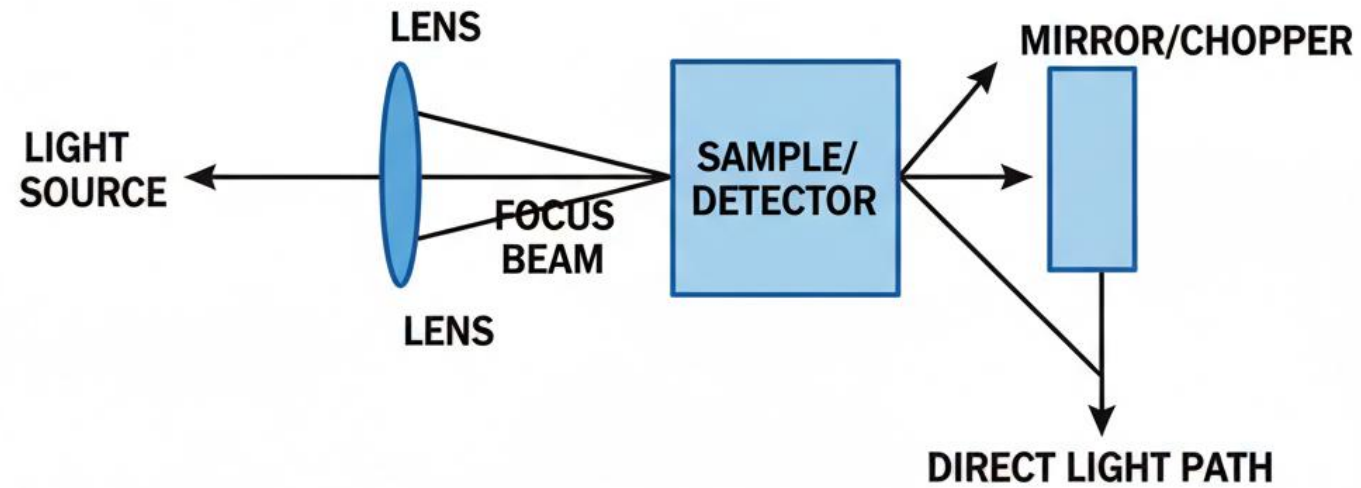
UV-VISIBILE
LINE SPECTRUM

WAVELENGTH RANGE: DEEP UV TO VISIBLE



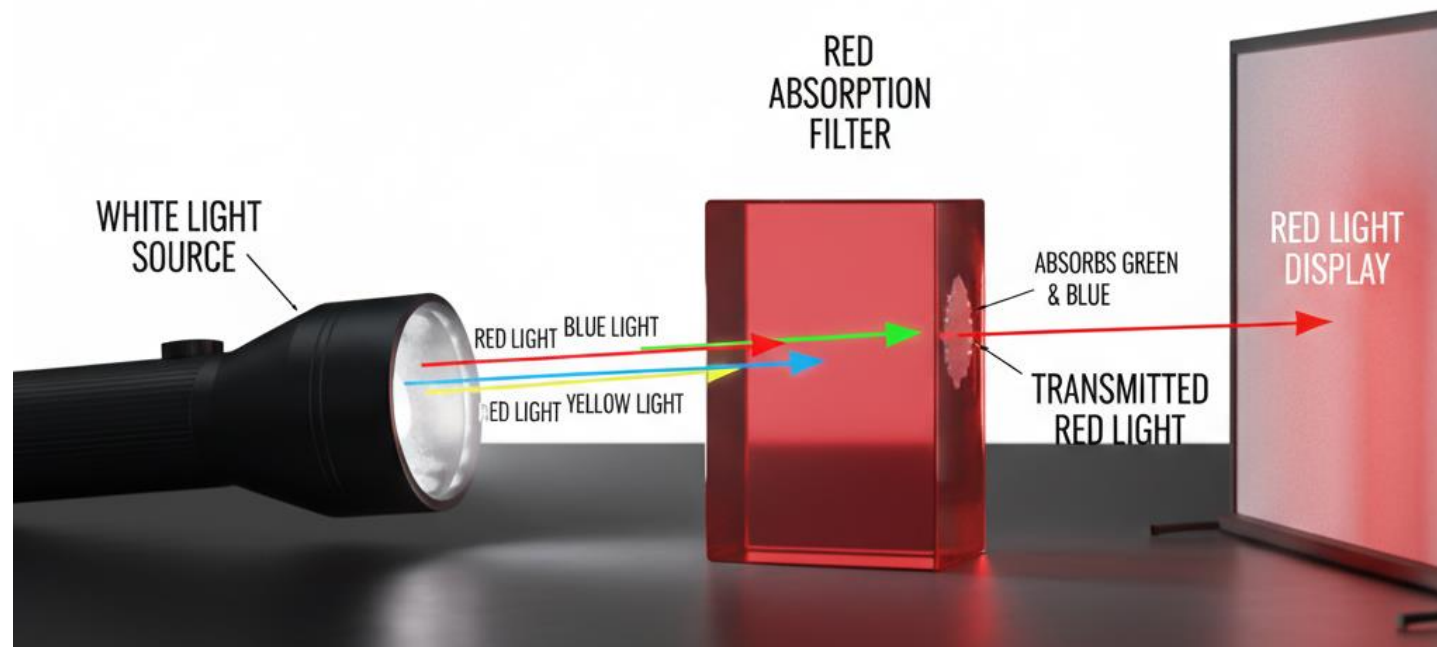
1. **DISCHARGE:** Electric current vaporizes Mercury, creating plasma.
2. **LINE** Specific UV & Visible waleelghts.

Lenses, Mirrors/ Choppers

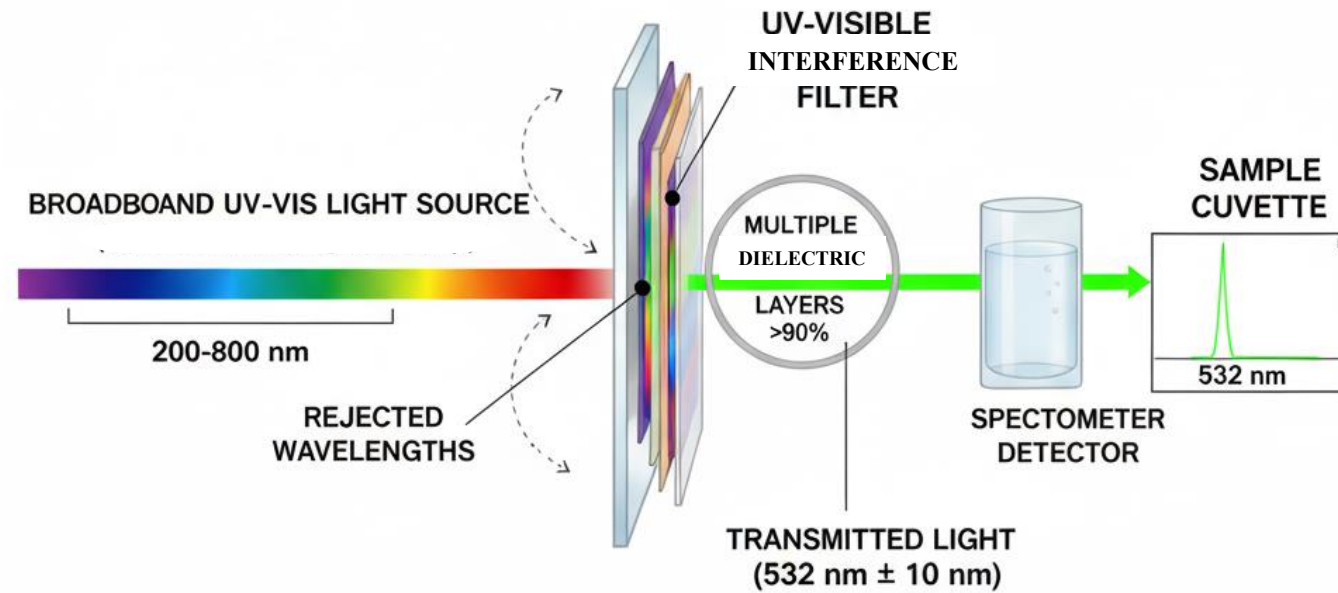


Filters

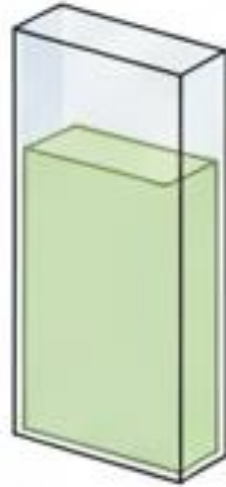
Absorption Filter



Interference Filter



Sample Cells

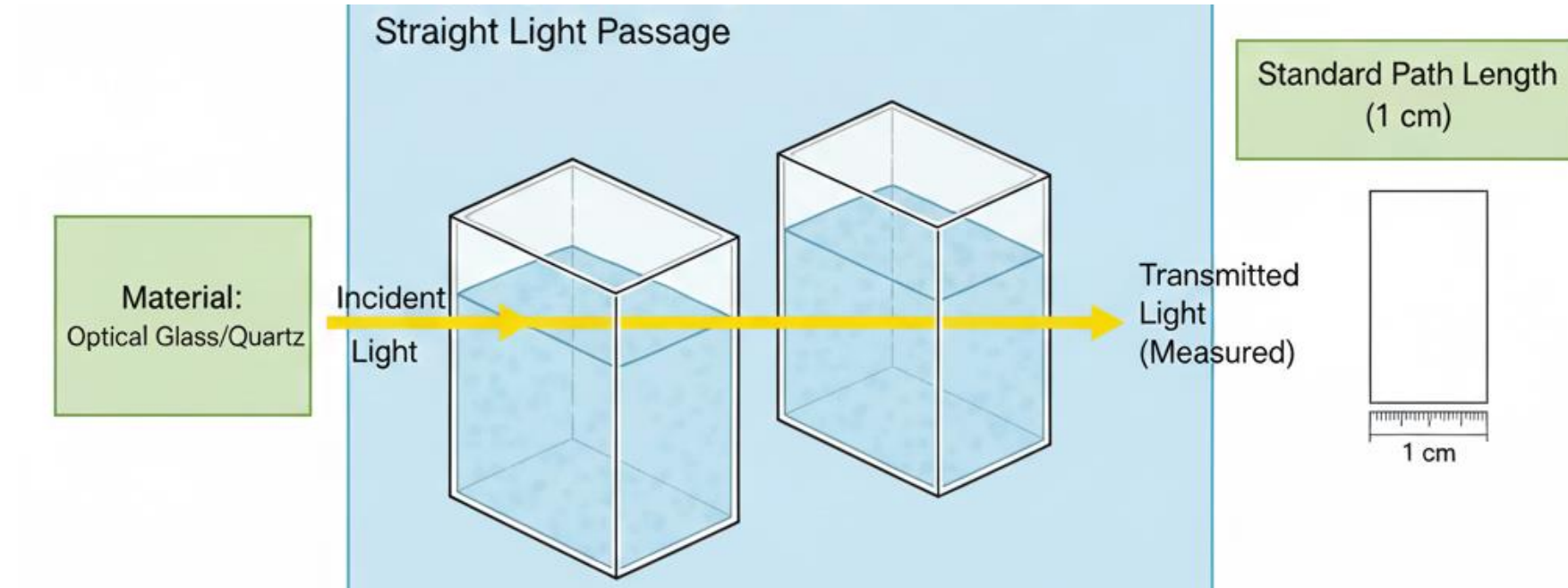


(Quartz)



(Glass/Plastic)

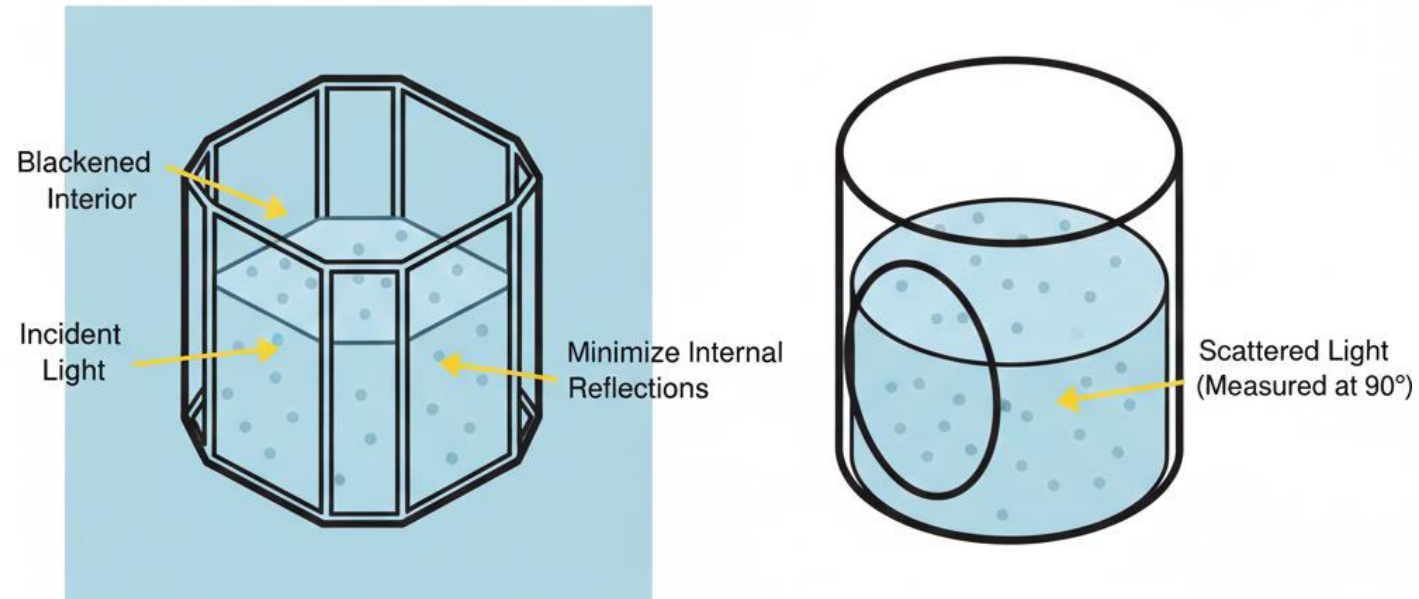
Sample Cells for Turbidimetry



Sample Cells for Nephelometry

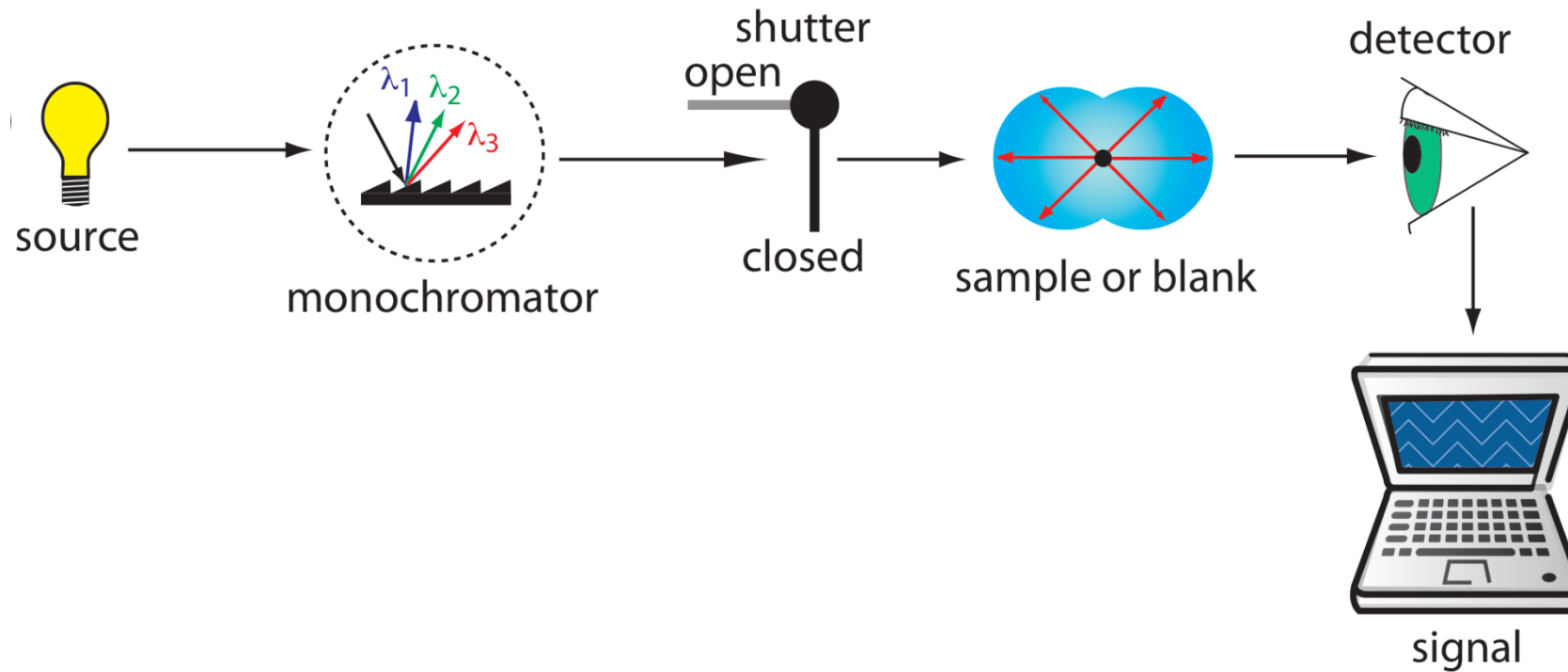
Semi-octagonal, round, or specially designed cells

Minimize internal reflections



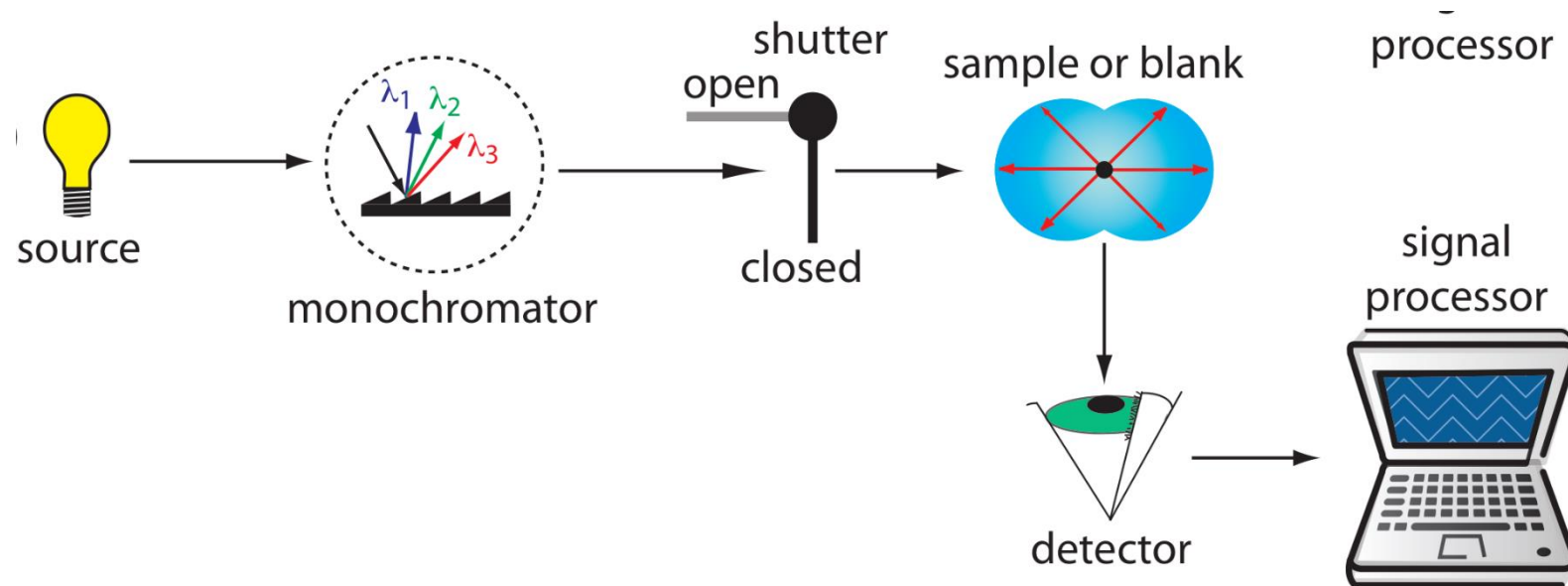
Detector Geometry - Turbidimetry

- Detector positioned at 180° (directly opposite source)
- Measures transmitted light intensity



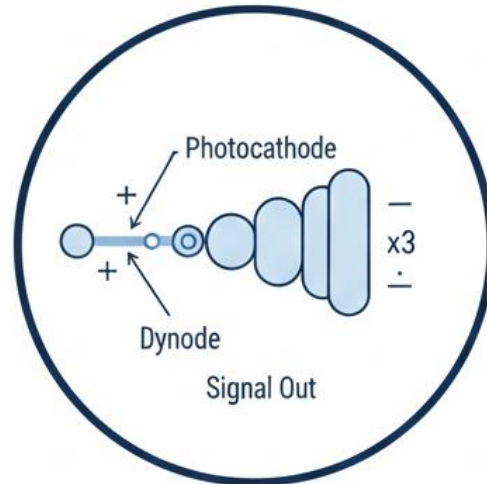
Detector Geometry - Nephelometry

- Detector positioned at 90° (or 70°-90° range) to incident beam
- Captures scattered light



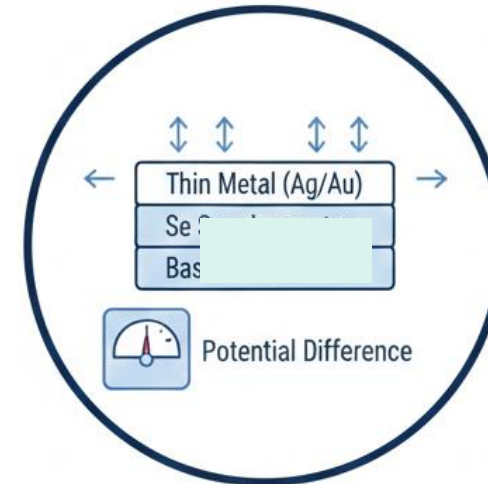
Detectors

FUNCTION: Convert Light to Electrical Signal



PHOTOMULTIPLIER TUBE (PMT)

Most Sensitive + Multiplies Signal

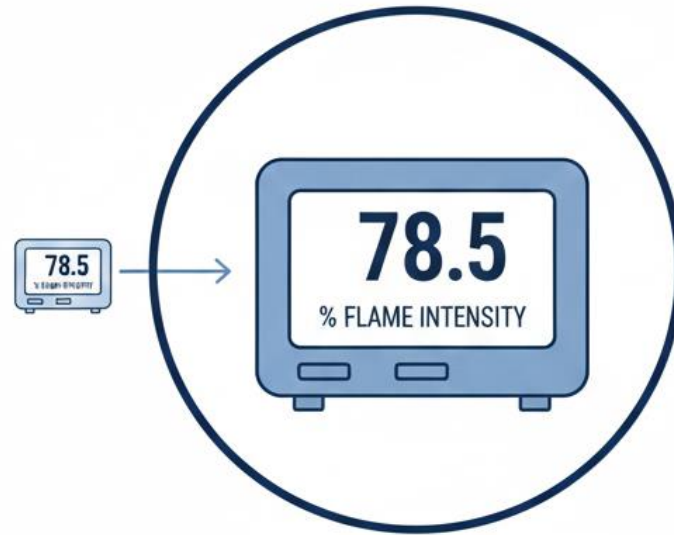


PHOTOVOLTATIC CELL

No Amplification



Readout Device



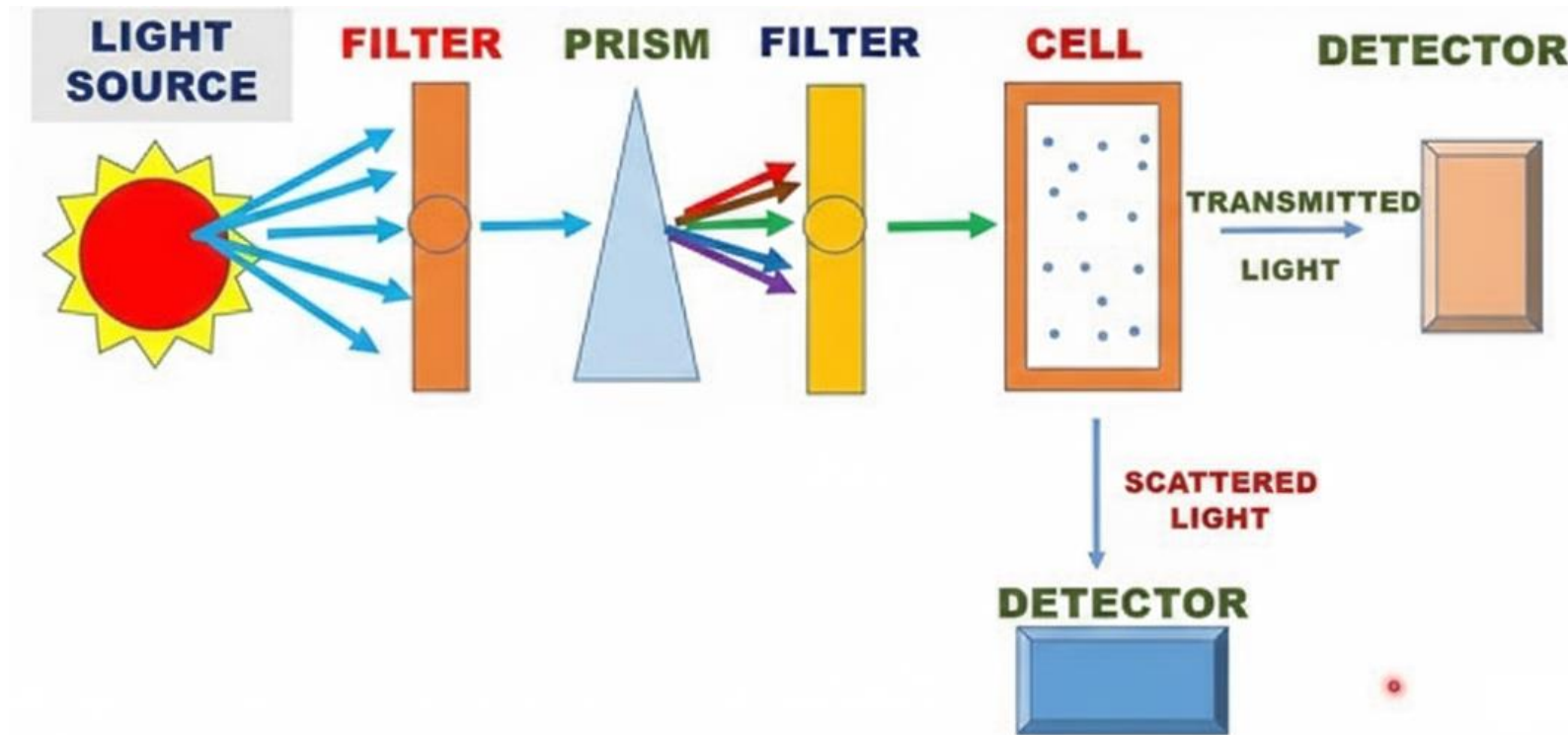
READOUT DEVICE

- Displays Detector Signal on Digital Scale
- Arbitrary Units / Proportional to Emitted Radiation

READOUT DEVICE: Converts Electrical Signal to Displayed Measurement



Summary



Assessment

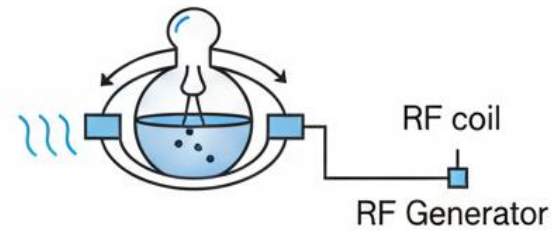
1. The most commonly used radiation source in nepheloturbidimetry instruments is:



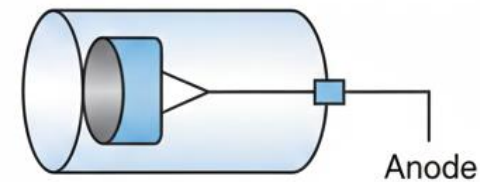
Assessment

1. The most commonly used radiation source in nepheloturbidimetry instruments is:

a) Electrodeless Discharge Lamp (EDL)



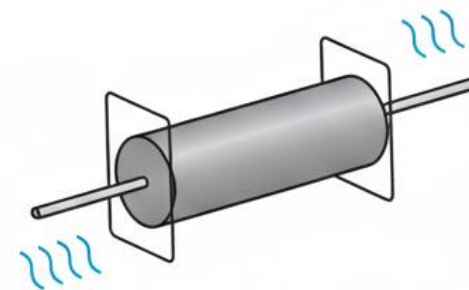
b) Hollow Cathode Lamp (HCL)



c) Tungsten filament lamp



d) Globar Source



Assessment

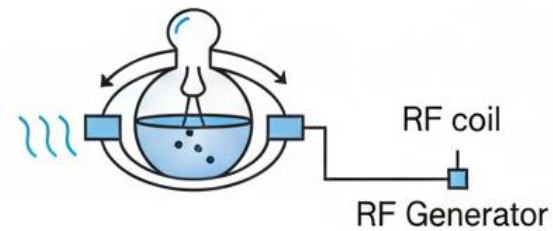
2. Alternative radiation source sometimes used in nepheloturbidimetry is:



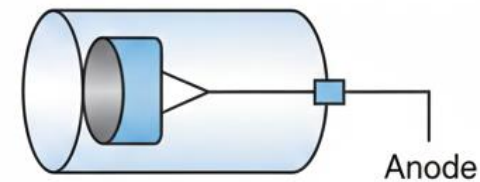
Assessment

2. Alternative radiation source sometimes used in nepheloturbidimetry is:

a) Electrodeless Discharge Lamp (EDL)



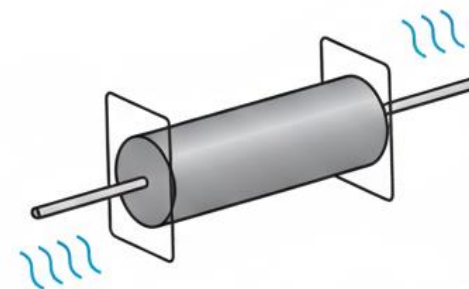
b) Hollow Cathode Lamp (HCL)



c) Tungsten filament lamp



d) Mercury arc lamp



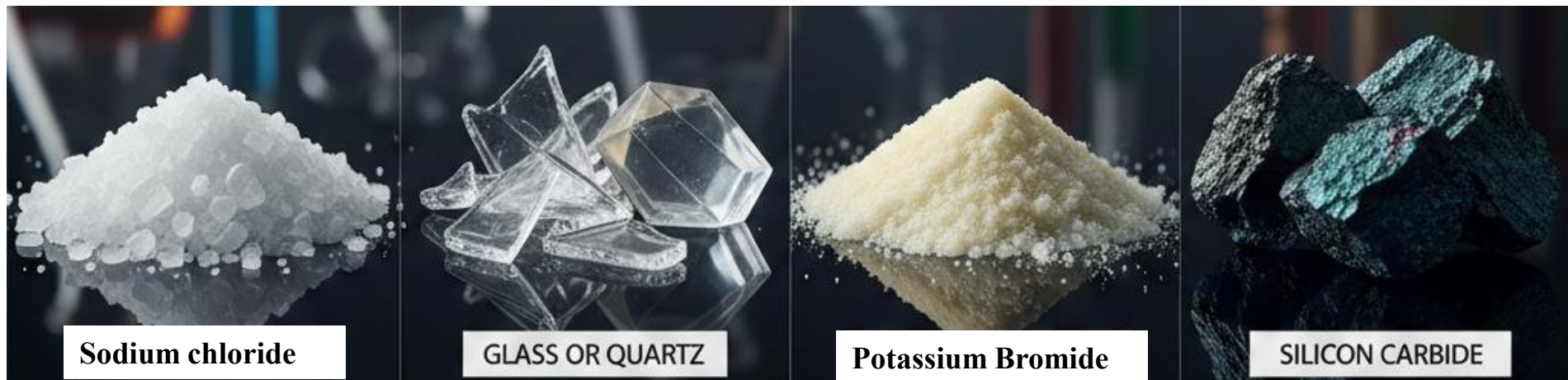
Assessment

3. Sample cells are commonly made of



Assessment

3. Sample cells are commonly made of



References

1. Skoog DA, Holler FJ, Crouch SR. Principles of instrumental analysis. 7th ed. Boston: Cengage Learning; 2018.
2. Beckett AH, Stenlake JB. Practical pharmaceutical chemistry. 4th ed. London: Athlone Press; 1988.
3. Willard HH, Merritt LL, Dean JA, Settle FA. Instrumental methods of analysis. 7th ed. New Delhi: CBS Publishers & Distributors; 1986.
4. Sharma BK. Instrumental methods of chemical analysis. 28th ed. Meerut: Goel Publishing House; 2019.
5. Chatwal GR, Anand SK. Instrumental methods of chemical analysis. 5th ed. Mumbai: Himalaya Publishing House; 2018.

Thank
you!