Name:jawad zeb

ID: 14179

PROGRAM:BS (MLT)

SEMESTER:6TH

INSTRUCTOR:MAEM SAIMA HADI

QUESTION NO.1: define magnification and resolution?

Answer:

: *Magnification:*

Magnification is the process of enlarging the [apparent size](https://en.wikipedia.org/wiki/Angular_diameter), not physical size, of something.

This enlargement is quantified by a calculated number also called "magnification". When this number is less than one, it refers to a reduction in size, sometimes called *minification* or *de-magnification*.

Typically, magnification is related to scaling up [visuals](https://en.wikipedia.org/wiki/Visual) or [images](https://en.wikipedia.org/wiki/Image) to be able to see more detail, increasing [resolution](https://en.wikipedia.org/wiki/Angular_resolution), using [microscope](https://en.wikipedia.org/wiki/Microscope), [printing](https://en.wikipedia.org/wiki/Printing) techniques, or [digital processing](https://en.wikipedia.org/wiki/Digital_processing). In all cases, the magnification of the image does not change the [perspective](https://en.wikipedia.org/wiki/Perspective_(graphical)) of the image.

*Examples of magnification:*

Some [optical instruments](https://en.wikipedia.org/wiki/Optical_instrument) provide visual aid by magnifying small or distant subjects.

* A [magnifying glass](https://en.wikipedia.org/wiki/Magnifying_glass), which uses a [positive (convex) lens](https://en.wikipedia.org/wiki/Lens_(optics)) to make things look bigger by allowing the user to hold them closer to their eye.
* A [telescope](https://en.wikipedia.org/wiki/Telescope), which uses its large [objective lens](https://en.wikipedia.org/wiki/Objective_(optics)) or [primary mirror](https://en.wikipedia.org/wiki/Primary_mirror) to create an image of a distant object and then allows the user to examine the image closely with a smaller [eyepiece](https://en.wikipedia.org/wiki/Eyepiece) lens, thus making the object look larger.

*Resolution:*

resolution is the ability to distinguish two points as separate structures rather a single fuzzy dot. In practice, resolution is a measure of the level of detail that can be seen using a microscope.

Separate the details of two particle in image.

Qusetion.2: write down the component of microscope?

Answer:

*component of microscope:*

**Eyepiece:** contain uni-ocular or bi-ocular lens and provide magnifying power of 10x to 15x

**Nosepiece:** contain objective lenses (3-4) and can easily rotate to change magnification

**Objective lenses**: 3-4 lenses with magnifying power of 4x, 10x, 40x and 100x (scanner, lowpower, high power and oil immersion)

**Stage clips**: grip the slides

**Stage:** support the slides

**Diaphragm:** control the conc and size of cone light.

**Light source**: provide light

**Base:** support the whole microscope

**Condenser lens**: focus light on sample

**Arm:** Support microscope during transported

**Coarse adjustment knob**: control up and down movement of stage

**Fine adjustment knob**: to fine the focusing

**Power cord**: cable that provide voltage to microscope

Question.3

write a note on flamephotomertery?

Answer :

Flamephotometery:

Flamephotometery is a branch of spectroscopy in which the species examine in the spectrometer are in the form of atom.

A photoelectric flame photometer is an instrument used in inorganic chemical analysis to determined the concentration of certain metal ions among them sodium,potassium, calcium and lithium.

Flame photometry is based on measurement of intensity of the light emitted when a metal is introduced into flame.

The wavelength of color tells us the element is qualitative.

The color’s intensity tells us that the element is quantitative.

*Principle:*

The basic principal upon which atomic spectroscopy is based in the fact that “matter absorbs light at the same wavelength at which it emits light”.

Atoms of elements— subjected to hot flame--- specific quantum of thermal energy absorbed by orbital electrons--- become unstable at high energy level--- release as photons of particular wavelength---- --change back to ground state.

When a metal salt solution is burned the metal provides a colored flame and each metal ion gives a different colored flame.

Flame tests therefore can be used to test for the absence or presence of metal ion.

*Basic concept:*

Liquid sample containing metal salt solution is introduced into a flame.

Solvent is first vaporized leaving particle of solid salt which is then vaporized into gaseous state.

Gaseous molecule dissociates to give neutral atoms which can be exited by thermal energy of flame.

The unstable excited atoms emit photons while returning to lower energy state.

The measurement of emitted photons forms the basis of flame photometry.

Under constant and controlled conditions, the light intensity of the characteristic wavelength produced by each of the atoms is directly proportional to the number of atoms that are emitting energy which in turn is directly proportional to the concentration of the substance of interest in the sample.

Various metals emitted a characteristic color of light when heated.

Q.4: What is centrifuge also explain its types?

Answer

: *Centrifuge:*

It is an apparatus that uses centrifugal force to separate particles from a suspension.

A centrifuge is a piece of equipment that puts an object in [rotation around a fixed axis](https://en.wikipedia.org/wiki/Rotation_around_a_fixed_axis) (spins it in a circle), applying a force perpendicular to the axis of spin (outward) that can be very strong.

The centrifuge works using the [sedimentation principle](https://en.wikipedia.org/wiki/Sedimentation)

OR

A centrifuge is a device for separating particles from a solution according to them

size

shape

density

viscosity of the medium

and rotor speed.

particles whose density is higher than that of the solvent sink (sediment)

particles that are lighter than it floats to the top.

*Principle:*

The centrifuge using the sedimentation principle

denser substances and particles move outward in the radial direction and settle down

less dense are displaced and move to the center.

*Components:*

Rotor

Drive shaft

Motor

Hanging buckets

Power switch

Timer

Tachometer

Brake

***Uses of centrifuge:***

Separation of serum from whole blood

Preparation of blood component

Determination of molecular weight (sedimentation principle)

Isolation of sub cellular organelle

Determination of purity of macromolecules

Q.5 Describe chromatography and its types?

Answer:

*Chromatography:*

Chromatography is actually a way of separating out a mixture of chemicals, which are in gas or liquid form, by letting them creep slowly past another substance, which is typically a liquid or solid. ... As the mobile phase moves, it separates out into its components on the stationary phase.

Separation technique

Used for the efficient separation of a number of similar components present in a mixture.

*Principle:*

Physical method of separation that distribute components to separate between two phases moves in a definite direction.

Substances are separated based on their differential distribution between two phases i,e mobile phase and stationary phase

*Types:*

There are four main types of chromatography.

Liquid Chromatography,

Gas Chromatography,

Thin-Layer Chromatography

Paper Chromatography.

*Liquid Chromatography:*

It is used in the world to test water samples to look for pollution in lakes and rivers. It is used to analyse metal ions and organic compounds in solutions. Liquid chromatography uses liquids which may incorporate hydrophilic, insoluble molecules.

*Gas Chromatography:*

It is used in airports to detect bombs and is used is forensics in many different ways. It is used to analysefibbers on a person’s body and also analyse blood found at a crime scene. In gas chromatography helium is used to move a gaseous mixture through a column of absorbent material.

*Thin-Layer Chromatography:*

It uses an absorbent material on flat glass or plastic plates. This is a simple and rapid method to check the purity of an organic compound. It is used to detect pesticide or insecticide residues in food. Thin-layer chromatography is also used in forensics to analyse the dye composition of fibbers

*Paper Chromatography:*

It is one of the most common types of chromatography. It uses a strip of paper as the stationary phase. Capillary action is used to pull the solvents up through the paper and separate the solutes.

Q.6: Explain the component of water bath?

Answer:

*Water bath:*

A water bath is a device used in the laboratories to incubate samples in water maintained at a constant temperature.

Temperature may be controlled digitally or by a dial and once set, the water bath cycles on and off to ensure constancy of the temperature.

Some water baths have an additional shaking or stirring mechanism that can be set at varying speeds

*Components of water bath*:

1. Vessel or trough of insulated metal.
2. Electric element.
3. Propeller or stirrer
4. Thermometer.
5. Thermostat.

*Insulated metal:*

Usually stainless steel.

Heat resistance.

*Electric element:*

Electric element to Heat water contain in trough.

*Propeller or stirrer*:

To circulate the water in the trough for maintenance.

*Thermometer:*

To check the temperature.

*Thermostat:*

To maintain the temperature.