

NAME : ANIMASHAUN

ADEBISI Q.

MATRIC NO : 17/

MHS06/069.

LEVEL : 400.

I.

Physics Of Light

Microscope.

A microscope is an instrument used to view objects that are not visible to the naked eyes. The magnification of the object is produced by the combined action of two convex lenses, the objective lens near the object and has typical magnification value from 5 to 100 and the eye piece (ocular) near the viewers eye has several lenses which slide inside a cylindrical barrel. This focusing ability is provided

by the movement of both the objective lens and the eye piece. Both lenses contribute to the final enlarged image produced in the location far enough from the observer to be easily viewed.

The light microscope consists of a light source, a condenser that focuses rays of light on the specimen, a stage on which a specimen is placed, an objective lens that produces a magnified image of the object in the specimen and an eye piece or ocular through which further magnified image of the object can be directly viewed (The object that is to be viewed by a light microscope has to be

sufficiently thin so that light can pass through it).

Terms And Principle Used In Microscopy.

-Reflection : this when a ray of light strikes a surface at an angle and it bounces back at an angle equal to the size. Reflection occurs when light passes through air and strikes an object, also when it strikes an interface between air and glass.

-Refraction : this is the bending of a light ray from normal when it passes into a different optical medium. A normal line is the line perpendicular to a flat surface.

-Refractive index : is the measure of refraction. It is proportional to the density of the medium.

-Principal focus and optical centre.

-Lens : an optical system, it collects light rays from an object and redirects them to form a sharp magnified image of the object in the image plane. There are two types which are the convex and the concave lens.

Magnification : The magnification produced by a lens is defined as the ratio of distance between the lenses and the image plane.

Illustration.

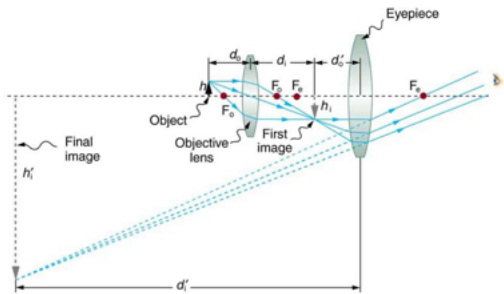


Figure : A Light field microscope composed of two lenses.

To see how the microscope forms an image, we consider two lenses in succession. The objective is slightly farther away from the object than the focal length, producing a case 1 image that is larger than the object. The first image is the object for the second lens or

eyepiece. The eyepiece is placed so that its focal length. Thus the eyepiece acts as a magnifying glass and the final image remains inverted, but it is farther from the objective observer making it easy to view. Since each lens produces a magnification that multiplies the height of the image, it is apparent that the overall magnification (m) is the product of the individual magnification. The lenses can be quite complicated and are constructed of multiple elements to reduce aberrations. Microscopic objective lenses are particularly important as they primarily gather light. Three

parameters that describe microscope objective are numerical aperture (NA), the magnification (m) and the working distance.

II.

A. Centrifuge:

it is a piece of equipment that puts an object in rotation around a fixed axis (spins in a circle) applying a force perpendicular to the axis of spin (outward) that can be very strong.

Principle:

The centrifuge exerts a centrifugal force (CF), which is greater than that of gravity and causes particles in the fluid to

sediment;the greater the CF,the faster and more effective the sedimentation.

Brands:

- Eppendorf laboratory centrifuge.
- OHAUS laboratory centrifuge.
- IKA laboratory scales.
- Eppendorf laboratory shakers.
- VWR laboratory shakers.

Cost:

- QISE Desktop Electric laboratory centrifuge machine laboratory practice-\$62.99.
- F2C Desktop laboratory lower-speed centrifuge machine-\$45.95.

Care and Maintenance Of A Centrifuge.

I. Using a non-corrosive disinfectant to clean the centrifuge from time to time.

II. By following maintenance procedures as given in the manufacturer's manual.

III. Cap the tubes or bottles when using a potentially infectious material.

IV. Balance the centrifuge by ensuring that the tubes opposite each other are of the same weight and size.

V. By avoiding to try to stop the centrifuge by hand while rotating and to avoid opening the centrifuge until the rotor stops completely and the tubes are at rest.

B. Automatic Tissue

Processor:

They greatly reduce time and labour needed to process tissue and thus allow a more rapid investigation to be carried out. The reduction in processing time is due to the agitation of the tissue constantly and therefore the transfer of the tissues from one reagent to the other is performed at shorter intervals. The use of this machine allows for the transfers to take place even during shut down hours of the laboratory. Most of them have twelve stations, the last two being wax bath. Dehydration clearing

and preparation for embedding are accomplished with this machine.

Principle:

They work on the principle of a central, rotating spindle that carries the bucket or basket containing the tissue blocks suspended from outer end of a horizontal radial arm.

TP 1050 Leica Processor model-The tissue basket oscillates up and down in each station at three seconds interval to ensure thorough and even mixing the reagents optimizes tissue infiltration.

Infiltration time is separately programmable for each section.

Brand:

**-KD-TS6A Automatic
Tissue Processor.**

**-Leica TP1020 Automatic
Tissue Processor.**

Cost:

**-MKLB-Lab Clinical
Analytical
Equipment; Vacuum
Automated Tissue
Processor-NGN**

701,381.34-

NGN1,558,625.20.

**-High Quality KD-TS6A
Automatic Tissue
Processor with English LCD
display-US \$1,000-3000/
set.**

C. Microtome.

**They are machines/
equipments used for**

cutting thin sections having fixed, processed and embedded the tissue. The microtomes are classified into various types but all should fulfil the following requirements;

- a. Rigid support for the knife and tissue block.
- b. Means of moving either the tissue block across the fixed knife-edge across the block.
- c. Means of accurately advancing the tissues to cut each section at the predetermined thickness.

The choice of microtome usually depends on the type of work and the nature of the tissue preparation and embedding.

Principle:

Microtome are used in tissue microscopy, allowing for the penetration of the sample for observation under transmitted light or electron radiation.

Brand:

-HM 450 Sliding microtome(Thermo Scientific).

-HM 340 Electronic Rotary microtome(Thermo Scientific).

-HM 355S Automatic microtome (Thermo Scientific).

-HM 430 Sliding microtome(Thermo Scientific).

-HM 325 Rotary microtome(Thermo Scientific).

Maintenance And Care Of A Microtome.

I. Daily routine care by removing sectioning debris from working area, brushing debris along the knife (always brush upwards).

II. Microtome knives or blades must be stored in their boxes when not in use.

III. Knives/blades fitted to the microtome must be properly guarded.

IV. A dry lint-free facial tissue can be used to wipe the microtome knife clean before use.

V. The microtome knife edge should be kept clean at all times.

Cost:

-Medical laboratory

**Equipment Feather Rotary
microtome-NGN**

1,052,072.01.

-CE approved Rotary

Tissue microtome-NGN

974,140.75-1,130,003.27.