

P.G. (SEM-II)
ZOOLOGY (HONS.)
CC-6, UNIT-I

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Topic : ULTRACENTRIFUGE

Introduction : A Centrifuge is a device that uses centrifugal force to separate various components of a mixture of fluid on the basis of their size, shape, density, the viscosity of the medium and rotor speed.

Today, centrifuges are routinely used in a variety of disciplines ranging from large-scale commercial applications to laboratory-scale scientific research. The number of centrifuge designs and configurations used in the mineral, chemical, medical, pharmaceutical, industrial waste, dairy, food, energy and agricultural industries also.

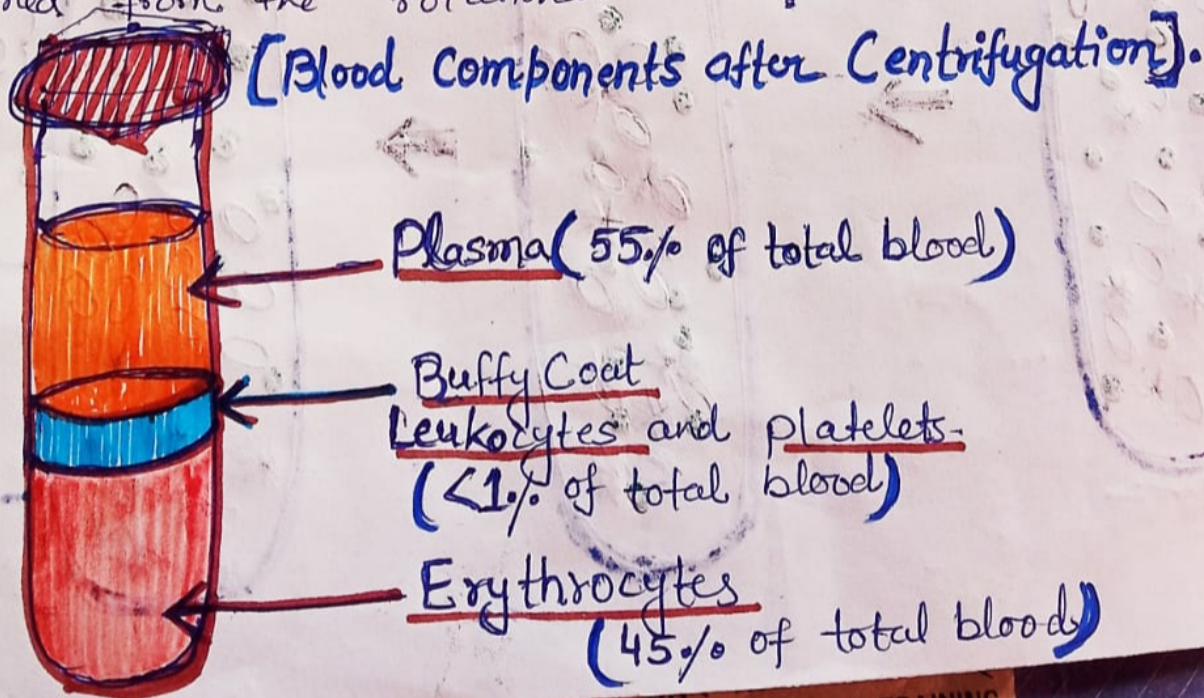
Ultracentrifuges are different specialized equipment, working at higher velocities. These are mostly used to separate macromolecules based on molecular mass.

History

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- Swedish Biochemist "Theodor Svedberg" invented the Ultracentrifuge in 1923.
- And he won the Nobel Prize in chemistry in 1926 for his research on colloids and proteins using the ultracentrifuge.

General Information :-

Centrifugation :- It is basically a separation method. Particles within the samples are separated by their shape, dimensions and density using the centrifugal force and obtained from the rotational motion.



ULTRACENTRIFUGATION.

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→ It is an important tool in biochemical research, which

(+) Ultracentrifugation is a specialized technique ^{that is} used to spin samples at exceptionally high speeds.

It is an important tool in biochemical research, which through rapid spinning imposes high centrifugal forces on suspended particles, or even molecules in solution, and causes separations of such matter on the basis of differences in weight.

Example: =

- ~~Red~~ Red blood cells separated from plasma of blood,
- nuclei from mitochondria in cell homogenates
- Isolation of macromolecules such as DNA, RNA, Lipids etc.

Ultracentrifuges are the most powerful type of centrifuge, they can spin in excess of 150,000 RPM.

→ Its rotational speed up to 150,000 rpm.
(Revolutions per minute)

