



Report

IN HOUSE TRAINING PROGRAM FOR TEACHING & NON TEACHING STAFF

As an institution grows in terms of size and complexity of its activities, it usually requires enhanced services of professional specialists who will not only have a good grasp of the functional information in the organisation but also an understanding of the sophisticated information supported by various instruments, devices etc.

Keeping this view in mind, Department of Botany has organized a “*In house training program for teaching & non teaching staff members*” on 11/12/2023. Mr. Nilesh Gudadhe, Sr. Instrumentation and Process Control Engineer, Remi India Ltd., Nagpur was the expertise resource person for the training program.

Dr. Subhash Somkuwar, Head, Dept. of Botany briefed about the event. Further he introduced the resource person. Mr. Gudadhe having vast experience and expertise in the field of instrumentation it's practical approach. He is also playing a role as a consultant to the various PG Departments of RTM Nagpur University, Nagpur.

In the training program, Mr. Gudadhe demonstrated the principle & working of Ultracentrifuge Machines etc.

Working & Principle of Soxhlet Apparatus: Centrifugation, and ultracentrifugation, is nowadays, at the core of the laboratory routine. They are used on a day-to-day basis in a wide range of experimental protocols, from concentrating solutions to isolating cells and subcellular components. In biology, the development of ultracentrifugation in the early 1900s, widened the possibilities of scientific research to the subcellular level, allowing for the separation of cellular components, such as organelles, lipid membranes, and even to purify proteins and ribonucleic acids (DNA and RNA).

Principle of Ultracentrifuge: • The ultracentrifuge works on the same principle as all other centrifuges. The working of an ultracentrifuge is based on the sedimentation principle, which states that the denser particles settle down faster when compared to less dense particles under gravity. • However, the sedimentation of particles under gravity would take a larger amount of time, and that is why an additional force is applied to aid the sedimentation process. • In an ultracentrifuge, the sample is rotated about an axis, resulting in a perpendicular force, called centrifugal force that acts on different particles on the sample. • The larger molecules move faster, whereas the smaller molecules move slower. • At the same time, denser molecules are moved outwards to the periphery of the tubes whereas the less dense molecules are rotated towards the center of the tube. • Once the process is completed, the larger and denser particles settle down, forming pellets at the bottom of the tube. In comparison, the smaller and less dense particles remain either in the suspended in the supernatant or float on the surface.



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Types of Ultracentrifugation: There is, currently on the market, a wide variety of ultracentrifuges. The choice among different brands and models must consider the type of experimental applications to be performed, the availability of different rotors (making it possible to adapt the ultracentrifuge to different experimental settings) and the temperature range. In that sense, two types of ultracentrifuges are available: analytical and preparative. Analytical ultracentrifugation is used in the study of purified macromolecules or supramolecular assemblies, while preparative ultracentrifugation is used in the actual separation of tissues, cells, subcellular components and other biochemically interesting particles.

The Ultracentrifuge: How to Use and How to Care Modern ultracentrifuges are heavy, sturdy equipment that requires certain know-how for proper usage and care. 1. Rotor balance. As in all centrifuges, sample spinning requires a proper balance of the weight inside the rotor. Moreover, in all ultracentrifuges, the rotor is encapsulated in a strong heavy metallic cage, to avoid vibrations and projections that could damage the sample and endanger the operator. Yet, it is of vital importance that the ultracentrifuge is properly loaded, according to the manufacturer's instructions. 2. Sample position in rotor. All rotor positions must be filled. Even when there are only a few tubes, the rest of the positions must be occupied with blank samples of equivalent weight. To ensure the proper function of the ultracentrifuge, care measures must be undertaken regularly. Apart from safety, proper loading of the rotor avoids excessive vibration, which can cause damage to the device. 3. Centrifuge cleaning. Maintenance and cleaning of the rotor must be done with non-abrasive detergents to avoid corrosion. Rotor cleaning is especially important to ensure that there are no remnants of the samples that were centrifuged, and therefore, should always be performed after spinning. 4. position in rotor. All rotor positions must be filled. Even when there are only a few tubes, the rest of the positions must be occupied with blank samples of equivalent weight. To ensure the proper function of the ultracentrifuge, care measures must be undertaken regularly. Apart from safety, proper loading of the rotor avoids excessive vibration, which can cause damage to the device.

Dr. Rahul B. Kamble has conducted the session efficiently while Mr. Tushar Pethkar gave formal vote of thanks.

Conclusion: From this type of training programs, it will help the teaching & non teaching staff to discharge their duties efficiently and intelligently.

Following teaching & non teaching staff members were present:

Teaching Staff:

1. Dr. Subhash R. Somkuwar
2. Dr. Rahul B. Kamble
3. Mr. Labhesh B. Parteti



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Non teaching Staff:

1. Mr. Tushar Pethkar
2. Mrs. Rashmi Chaudhary
3. Mr. Kuwarlal Pandhare
4. Mr. Nikhil Chaudhary
5. Ms. Shweta Wankhede

Some Glimpses of Training Program

