



# JSS College of Arts, Commerce and Science

Autonomous under University of Mysore  
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POST GRADUATE DEPARTMENT OF ZOOLOGY

## Standard Operating Procedures (SOPs)

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Approved by:

HOD

Postgraduate Department of Zoology  
JSS College of Arts, Commerce & Science  
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POST GRADUATE DEPARTMENT OF ZOOLOGY

## Standard Operating Procedure (SOP)

Standard Operating Procedure for Hot Plate

SOP-ZOO-001

## Hot Plate

**Purpose:** This SOP outlines the proper usage and safety precautions for operating the Kemi KHPE-ISS Hot Plate in the laboratory.

### **Equipment:**

Kemi KHPE-ISS Hot Plate

Power source

Laboratory utensils and glassware

### **Safety Precautions:**

- Before use, familiarize yourself with the Kemi KHPE-ISS Hot Plate user manual and safety guidelines.
- Ensure that the hot plate is placed on a stable, flat surface to prevent accidents.
- Do not operate the hot plate in wet or damp conditions.
- Use appropriate personal protective equipment (PPE) such as heat-resistant gloves and safety goggles.
- Keep flammable materials away from the hot plate during operation.
- Do not touch the hot plate surface directly during or after operation; it may cause burns.

### **Setup:**

- Place the Kemi KHPE-ISS Hot Plate on a clean and dry surface.
- Ensure that the power source is compatible with the hot plate's requirements.
- Connect the hot plate to the power source using the provided power cord.
- Turn on the hot plate using the power switch.

### **Operation:**

- Set the desired temperature using the temperature control knob.
- Allow the hot plate to reach the set temperature before placing any materials on it.
- Use appropriate laboratory utensils and glassware on the hot plate surface.
- Monitor the temperature closely during operation.
- Turn off the hot plate using the power switch when finished.

### Shutdown:

- Turn off the hot plate using the power switch.
- Allow the hot plate to cool down before storing or cleaning.

### Cleaning and Maintenance:

- Disconnect the hot plate from the power source before cleaning.
- Clean the hot plate surface with a mild detergent and a non-abrasive cloth.
- Periodically inspect the power cord for any signs of damage and replace if necessary.
- Follow the manufacturer's recommendations for routine maintenance.

### Emergency Procedures:

- In case of fire, use an appropriate fire extinguisher or emergency response procedures.
- In the event of Electrical issues, disconnect the hot plate from the power source immediately.
- For burns or injuries, seek medical attention promptly.

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POST GRADUATE DEPARTMENT OF ZOOLOGY

**Standard Operating Procedure  
(SOP)**

Standard Operating Procedure for Deep Freezer

SOP-ZOO-002

## Deep Freezer

**Purpose:** This SOP outlines the proper procedures for the safe and efficient operation of the Blue Star Deep Freezer (100L) in the laboratory.

### **Equipment:**

- Blue Star Deep Freezer (100L)
- Power source

### **Safety Precautions:**

- Read and familiarize yourself with the Blue Star Deep Freezer user manual and safety guidelines before operation.
- Ensure proper ventilation around the deep freezer to prevent overheating.
- Do not overload the freezer; follow the manufacturer's recommendations for maximum load capacity.
- Keep the freezer away from heat sources, direct sunlight, and flammable materials.
- Use appropriate personal protective equipment (PPE), such as gloves, when handling frozen materials.

### **Setup:**

- Place the Blue Star Deep Freezer in a well-ventilated and stable location.
- Ensure that the power source is compatible with the deep freezer's requirements.
- Connect the deep freezer to the power source using the provided power cord.
- Set the desired temperature using the temperature control settings.

### **Operation:**

- Allow the deep freezer to reach the set temperature before placing materials inside.
- Store materials in a well-organized manner to allow proper air circulation.
- Periodically check the temperature using a monitoring device if available.
- If the deep freezer is equipped with an alarm system, ensure it is functional and set to appropriate thresholds.
- Avoid frequent door opening to maintain a stable internal temperature.

#### Shutdown:

- Turn off the deep freezer using the power switch.
- Disconnect the deep freezer from the power source.
- Remove all materials from the freezer before cleaning or maintenance.
- Keep the freezer door slightly ajar during extended periods of non-use to prevent odors.

#### Cleaning and Maintenance:

- Disconnect the deep freezer from the power source before cleaning.
- Clean the interior with a mild detergent and a non-abrasive cloth.
- Periodically defrost the freezer following the manufacturer's instructions.
- Clean the exterior of the deep freezer with a mild detergent and a non-abrasive cloth.
- Inspect the power cord and plug for any signs of damage and replace if necessary.

#### Emergency Procedures:

- In case of a power outage, minimize door opening to preserve the internal temperature.
- If an alarm sounds, investigate the cause, and take appropriate action.
- In the event of a malfunction, disconnect the deep freezer from the power source and report the issue to the maintenance team.

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POST GRADUATE DEPARTMENT OF ZOOLOGY

## Standard Operating Procedure (SOP)

Standard Operating Procedure for Magnetic Stirrer

SOP-ZOO-003



## Magnetic Stirrer

**Purpose:** This SOP establishes guidelines for the safe and efficient operation of the Magnetic Stirrer without a hotplate in the laboratory.

### **Equipment:**

- Magnetic Stirrer (without Hotplate)
- Magnetic stir bar
- Laboratory glassware
- Stirring vessels
- Power source

### **Safety Precautions:**

- Read and understand the user manual and safety guidelines for the Magnetic Stirrer before operation.
- Wear appropriate personal protective equipment (PPE) such as gloves and safety goggles.
- Keep hands and clothing away from the rotating magnetic stir bar during operation.
- Ensure that the magnetic stir bar is clean and free from chips or cracks.
- Disconnect the magnetic stirrer from the power source before cleaning or maintenance.

### **Setup:**

- Place the Magnetic Stirrer on a clean and stable surface.
- Ensure that the power source is compatible with the magnetic stirrer's requirements.
- Insert the magnetic stir bar into the stirring vessel.
- Adjust the speed control to the desired stirring speed.

### **Operation:**

- Turn on the magnetic stirrer using the power switch.
- Adjust the speed control to achieve the desired stirring rate.
- Place the stirring vessel with the magnetic stir bar on the stirrer's platform.
- Ensure that the magnetic stir bar is fully submerged in the liquid.
- Monitor the stirring process to ensure proper mixing.

### Shutdown:

- Turn off the magnetic stirrer using the power switch.
- Allow the magnetic stir bar to come to a complete stop before removing the stirring vessel.
- Disconnect the magnetic stirrer from the power source.
- Remove the magnetic stir bar from the stirring vessel.

### Cleaning and Maintenance:

- Disconnect the magnetic stirrer from the power source before cleaning.
- Wipe the stirrer's surface with a mild detergent and a non-abrasive cloth.
- Inspect the magnetic stir bar for any damage and replace if necessary.
- Store the magnetic stir bar in a safe and clean location.
- Periodically check the power cord and plug for signs of wear or damage.

### Emergency Procedures:

- In case of a malfunction or unusual noise, turn off the magnetic stirrer immediately and investigate the cause.
- Disconnect the magnetic stirrer from the power source in the event of smoke or Electrical issues.
- In case of injury, seek medical attention promptly.

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POST GRADUATE DEPARTMENT OF ZOOLOGY

## Standard Operating Procedure (SOP)

Standard Operating Procedure for Electronic Weighing Balance

SOP-ZOO-004

## Electronic Weighing Balance

**Purpose:** This SOP establishes guidelines for the proper usage and maintenance of the Shimadzu Electronic Weighing Balance in the laboratory.

### **Equipment:**

- Shimadzu Electronic Weighing Balance
- Anti-static brush or cloth
- Power source

### **Safety Precautions:**

- Read and understand the user manual and safety guidelines for the Shimadzu Electronic Weighing Balance before operation.
- Ensure the balance is placed on a stable and vibration-free surface.
- Do not place liquids or chemicals directly on the balance; use appropriate containers.
- Avoid exposing the balance to extreme temperatures or humidity.
- Handle weights and samples with care to prevent spills or contamination.

### **Setup:**

- Place the Shimadzu Electronic Weighing Balance in a clean and level location.
- Connect the balance to a stable power source using the provided power cord.
- Allow the balance to warm up for the recommended duration, if specified by the manufacturer.
- If required, perform a calibration using standard weights following the manufacturer's instructions.

### **Operation:**

- Turn on the balance using the power switch.
- Allow the balance to stabilize before placing any samples.
- Close all doors and windows to prevent air currents that may affect measurements.
- Gently place the sample on the centre of the weighing pan.
- Read the weight displayed on the balance screen and record if necessary.
- Avoid slamming doors or creating vibrations near the balance during operation.

#### Shutdown:

- Clear the weighing pan of any materials before turning off the balance.
- Turn off the balance using the power switch.
- Disconnect the balance from the power source.
- Close all doors and windows to protect the balance from dust or contaminants.

#### Cleaning and Maintenance:

- Disconnect the balance from the power source before cleaning.
- Wipe the weighing pan and surrounding surfaces with an anti-static brush or cloth.
- Clean the balance with a mild detergent and a non-abrasive cloth.
- Use a lint-free cloth for cleaning the display and control panel.
- Perform regular calibration checks using standard weights.

#### Emergency Procedures:

- In case of a sudden power outage, record the current measurement, and secure the sample.
- In the event of a malfunction or unusual behaviour, contact the maintenance team.
- If the balance displays an error, do not attempt to repair it yourself; seek professional assistance.

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POST GRADUATE DEPARTMENT OF ZOOLOGY

## Standard Operating Procedure (SOP)

Standard Operating Procedure for Dissection Microscope

SOP-ZOO-005



## Dissection microscope

**Purpose:** This SOP establishes guidelines for the safe and efficient operation of the Dissection Microscope in the laboratory.

### **Equipment:**

- Dissection Microscope
- Specimens for dissection
- Dissection tools (scalpel, forceps, etc.)
- Microscope slides and coverslips (if applicable)
- Illumination source (if separate)

### **Safety Precautions:**

- Read and understand the user manual and safety guidelines for the Dissection Microscope before operation.
- Use personal protective equipment (PPE) such as gloves and safety goggles when handling specimens.
- Handle sharp dissection tools with care to prevent injuries.
- Keep the work area clean and organized to avoid accidents.
- Turn off the microscope and disconnect from the power source when not in use.

### **Setup:**

- Place the Dissection Microscope on a clean and stable surface.
- Ensure that the microscope is connected to a stable power source if it has an integrated light source.
- Adjust the height and angle of the microscope for comfortable viewing.
- Place the specimen on the dissection stage or dissecting dish.

### **Operation:**

- Turn on the microscope's light source if applicable.
- Adjust the focus using the coarse and fine focus knobs.
- Use the magnification adjustments to achieve the desired level of detail.
- Handle dissection tools carefully and use them only for their intended purpose.



- When using a microscope slide, place the specimen under the objective lens and secure it with the stage clips.
- Keep the microscope and work area clean during dissection.

#### Shutdown:

- Turn off the microscope's light source if applicable.
- Lower the stage using the coarse focus knob.
- Gently clean the lenses with a lens cleaning solution and lens paper.
- Disconnect the microscope from the power source.
- Dispose of specimens and biological materials according to laboratory protocols.

#### Cleaning and Maintenance:

- Disconnect the microscope from the power source before cleaning.
- Clean the lenses with a lens cleaning solution and lens paper.
- Wipe down the microscope with a mild detergent and a non-abrasive cloth.
- Inspect the power cord and plug for any signs of wear or damage.

#### Emergency Procedures:

- In case of Electrical issues, disconnect the microscope from the power source immediately.
- In the event of a malfunction, report the issue to the laboratory supervisor or maintenance team.
- For injuries during dissection, seek medical attention promptly.

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POST GRADUATE DEPARTMENT OF ZOOLOGY

## Standard Operating Procedure (SOP)

Standard Operating Procedure for Compound Microscope

SOP-ZOO-006



## Compound Microscope

**Purpose:** This SOP provides guidelines for the proper use and maintenance of the compound microscope to ensure accurate and reliable microscopy observations.

### **Responsibilities:**

- Microscope User: Responsible for following the operating procedures outlined in this document.
- Lab Supervisor: Responsible for ensuring that users are trained and compliant with this SOP.

### **Procedure Steps:**

#### ❖ Microscope Setup:

- Place the microscope on a stable surface.
- Ensure proper illumination by adjusting the light source.

#### ❖ Sample Preparation:

- Prepare the sample according to the specific requirements of your analysis.
- Ensure the sample is clean and properly mounted on a slide.

#### ❖ Microscope Alignment:

- Turn on the microscope and adjust the ocular and objective lenses.
- Center the specimen in the field of view using the stage controls.

#### ❖ Magnification Adjustment:

- Rotate the objective turret to select the desired magnification.
- Use the fine and coarse focus knobs to achieve a clear image.

#### ❖ Observation:

- Observe the specimen, adjusting focus and magnification as needed.
- Record observations or capture images as necessary.

#### ❖ Microscope Shutdown:

- Turn off the light source.
- Lower the stage and remove the slide.
- Clean the lenses and stage with a suitable cleaning solution.

### Safety Precautions:

- Always handle the microscope with care to avoid damage.
- Do not use excessive force when adjusting components.
- Follow laboratory safety protocols when dealing with samples.

### Equipment and Materials:

- Compound microscope with appropriate lenses.
- Prepared microscope slides.
- Cleaning solution and lens tissue.

### Troubleshooting and Problem-Solving:

- Refer to the microscope manual for specific troubleshooting steps.
- Contact the laboratory supervisor if issues persist.

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**Standard Operating Procedure  
(SOP)**

Standard Operating Procedure for Bacteriological Incubator

SOP-ZOO-007

## Bacteriological Incubator

**Purpose:** To establish guidelines for the proper usage and maintenance of the Bacteriological Incubator in the laboratory.

### **Equipment:**

- Bacteriological Incubator
- Thermometer
- Culture plates or tubes
- Samples for incubation

### **Safety Precautions:**

- Read and understand the user manual and safety guidelines for the Bacteriological Incubator before operation.
- Avoid overloading the incubator; follow the manufacturer's recommendations for maximum load capacity.
- Keep the incubator away from heat sources, direct sunlight, and flammable materials.
- Ensure that the incubator is placed on a stable surface.
- Handle samples and cultures with care to prevent spills or contamination.

### **Setup:**

- Place the Bacteriological Incubator in a well-ventilated and stable location.
- Ensure that the power source is compatible with the incubator's requirements.
- Insert a thermometer into the incubator to monitor the temperature.
- Set the desired temperature on the incubator's control panel.

### **Operation:**

- Turn on the incubator using the power switch.
- Allow the incubator to reach the set temperature before placing samples inside.
- Place culture plates or tubes with samples on the incubator shelves.
- Close the incubator door gently to avoid disrupting the internal temperature.
- Monitor the temperature regularly using the built-in thermometer.
- Avoid frequent door opening to maintain a stable internal environment.

### Shutdown:

- Remove all samples from the incubator before turning it off.
- Turn off the incubator using the power switch.
- Disconnect the incubator from the power source.
- Leave the incubator door slightly ajar to allow cooling before final cleaning.

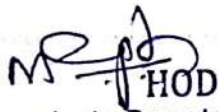
### Cleaning and Maintenance:

- Disconnect the incubator from the power source before cleaning.
- Clean the interior with a mild detergent and a non-abrasive cloth.
- Wipe down the exterior of the incubator with a mild detergent and a non-abrasive cloth.
- Periodically check the seals on the incubator door for wear and replace if necessary.
- Inspect the power cord and plug for any signs of damage and replace if necessary.

### Emergency Procedures:

- In case of a power outage, minimize door opening to preserve the internal temperature.
- If the incubator malfunctions, disconnect it from the power source and report the issue to the maintenance team.
- In the event of a temperature deviation, assess the impact on samples and take appropriate action.

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**Standard Operating Procedure  
(SOP)**

Standard Operating Procedure for Centrifuge

SOP-ZOO-008





## Centrifuge

**Purpose:** This SOP establishes guidelines for the safe and efficient operation of the Centrifuge with a 4-tube, 50 mL capacity in the laboratory.

### **Equipment:**

- Centrifuge (4-tube, 50 mL capacity)
- Centrifuge tubes (50 mL)
- Balanced samples for centrifugation
- Power source

### **Safety Precautions:**

- Read and understand the user manual and safety guidelines for the Centrifuge before operation.
- Use appropriate personal protective equipment (PPE) such as gloves and safety goggles.
- Balance samples carefully to avoid uneven loading in the centrifuge tubes.
- Ensure that the centrifuge is placed on a stable and level surface.
- Allow the centrifuge to come to a complete stop before opening the lid.

### **Setup:**

- Place the Centrifuge in a well-ventilated and stable location.
- Ensure that the power source is compatible with the centrifuge's requirements.
- Check the rotor and centrifuge tubes for any signs of damage or wear.
- Load the centrifuge tubes with balanced samples according to the manufacturer's guidelines.

### **Operation:**

- Close the lid securely before starting the centrifuge.
- Set the timer and adjust the speed according to the required centrifugation protocol.
- Start the centrifuge and monitor the process through the transparent lid or display.
- Allow the centrifuge to complete the cycle and come to a complete stop.

- Wait for a few moments after stopping before opening the lid to avoid sample disturbance.

#### Shutdown:

- Open the centrifuge lid only after the rotor has come to a complete stop.
- Unload the centrifuge tubes carefully, ensuring no spills or contamination.
- Turn off the centrifuge using the power switch.
- Disconnect the centrifuge from the power source.
- Clean the centrifuge chamber and rotor if necessary.

#### Cleaning and Maintenance:

- Disconnect the centrifuge from the power source before cleaning.
- Wipe down the interior and exterior of the centrifuge with a mild detergent and a non-abrasive cloth.
- Clean the rotor and centrifuge tubes according to the manufacturer's instructions.
- Inspect the power cord and plug for any signs of wear or damage and replace if necessary.

#### Emergency Procedures:

- In case of an imbalance or unusual noise during operation, stop the centrifuge immediately.
- In the event of a power outage, wait for the centrifuge to come to a complete stop before opening the lid.
- Report any malfunctions or abnormalities to the laboratory supervisor or maintenance team.

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**Standard Operating Procedure  
(SOP)**

Standard Operating Procedure for Microfuge

SOP-ZOO-009



## Microfuge

**Purpose:** This SOP establishes the guidelines for the safe and efficient operation of the Microcentrifuge with an 8-tube, 1.5 mL Eppendorf capacity in the laboratory.

### **Equipment:**

- Microcentrifuge (8-tube, 1.5 mL Eppendorf capacity)
- Eppendorf tubes (1.5 mL)
- Balanced samples for centrifugation
- Power source

### **Safety Precautions:**

- Read and understand the user manual and safety guidelines for the Microcentrifuge before operation.
- Use appropriate personal protective equipment (PPE) such as gloves and safety goggles.
- Balance samples carefully to avoid uneven loading in the Eppendorf tubes.
- Ensure that the microcentrifuge is placed on a stable and level surface.
- Allow the microcentrifuge to come to a complete stop before opening the lid.

### **Setup:**

- Place the Microcentrifuge in a well-ventilated and stable location.
- Ensure that the power source is compatible with the microcentrifuge's requirements.
- Check the rotor and Eppendorf tubes for any signs of damage or wear.
- Load the Eppendorf tubes with balanced samples according to the manufacturer's guidelines.

### **Operation:**

- Close the lid securely before starting the microcentrifuge.
- Set the timer and adjust the speed according to the required centrifugation protocol.
- Start the microcentrifuge and monitor the process through the transparent lid or display.
- Allow the microcentrifuge to complete the cycle and come to a complete stop.

- Wait for a few moments after stopping before opening the lid to avoid sample disturbance.

#### Shutdown:

- Open the microcentrifuge lid only after the rotor has come to a complete stop.
- Unload the Eppendorf tubes carefully, ensuring no spills or contamination.
- Turn off the microcentrifuge using the power switch.
- Disconnect the microcentrifuge from the power source.
- Clean the microcentrifuge chamber and rotor if necessary.


#### Cleaning and Maintenance:

- Disconnect the microcentrifuge from the power source before cleaning.
- Wipe down the interior and exterior of the microcentrifuge with a mild detergent and a non-abrasive cloth.
- Clean the rotor and Eppendorf tubes according to the manufacturer's instructions.
- Inspect the power cord and plug for any signs of wear or damage and replace if necessary.

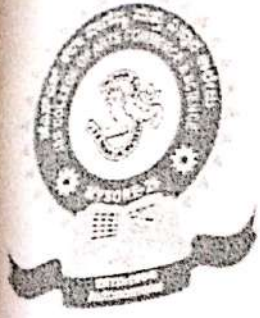
#### Emergency Procedures:

- In case of an imbalance or unusual noise during operation, stop the microcentrifuge immediately.
- In the event of a power outage, wait for the microcentrifuge to come to a complete stop before opening the lid.
- Report any malfunctions or abnormalities to the laboratory supervisor or maintenance team.

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POST GRADUATE DEPARTMENT OF ZOOLOGY

## Standard Operating Procedure (SOP)

Standard Operating Procedure for Micropipette (1000 $\mu$ L)

SOP-ZOO-010



## Micropipette (1000 $\mu$ L)

**Purpose:** This SOP establishes the guidelines for the safe and accurate usage of the 1000  $\mu$ L Micropipette in the laboratory.

### **Equipment:**

- Micropipette (1000  $\mu$ L)
- Appropriate tips for 1000  $\mu$ L pipette
- Laboratory samples
- Pipette stand or rack
- Work surface or pipetting station

### **Safety Precautions:**

- Read and understand the user manual and safety guidelines for the 1000  $\mu$ L Micropipette before operation.
- Wear appropriate personal protective equipment (PPE) such as gloves and a lab coat.
- Ensure that the micropipette is clean and calibrated before use.
- Handle samples with care to avoid spills or contamination.
- Avoid using excessive force when operating the micropipette to prevent damage.

### **Setup:**

- Ensure that the micropipette is set to the correct volume (1000  $\mu$ L) according to the experiment's requirements.
- Attach a compatible tip to the micropipette.
- Place the micropipette in a pipette stand or rack on the work surface.

### **Operation:**

- Gently press the plunger button to the first stop to draw the sample into the pipette tip.
- Position the pipette tip into the sample solution.
- Slowly release the plunger to the starting position to aspirate the correct volume.
- Transfer the sample to the desired destination (e.g., microcentrifuge tube, well plate) by gently pressing the plunger to the second stop.

- Hold the pipette in a vertical position for a few seconds to ensure complete sample delivery.
- Eject the used pipette tip into a designated waste container.

#### Shutdown:

- Release any remaining pressure in the pipette by gently pressing the plunger to the second stop without a tip.
- Store the micropipette in a designated area or pipette stand.
- Ensure that the micropipette is clean and free from any residual samples.
- Check and, if necessary, recalibrate the micropipette according to the manufacturer's guidelines.

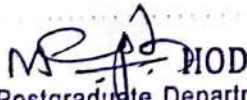
#### Cleaning and Maintenance:

- Wipe the external surfaces of the micropipette with a mild detergent and a lint-free cloth.
- Use a designated cleaning solution for removing any residue on the pipette.
- Regularly check and replace the pipette tip to prevent cross-contamination.
- Follow the manufacturer's recommendations for periodic maintenance and calibration.

#### Emergency Procedures:

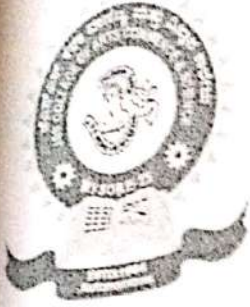
- In case of accidental sample contamination or spillage, clean the micropipette immediately using appropriate cleaning solutions.
- If the micropipette malfunctions or shows inconsistencies, remove it from service and report the issue to the laboratory supervisor.

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POST GRADUATE DEPARTMENT OF ZOOLOGY

**Standard Operating Procedure  
(SOP)**

Standard Operating Procedure for Micropipette (100 $\mu$ L)

SOP-ZOO-011

## Micropipette (100 $\mu$ L)

**Purpose:** This SOP establishes the guidelines for the safe and accurate usage of the 100  $\mu$ L Micropipette in the laboratory.

### **Equipment:**

- Micropipette (100  $\mu$ L)
- Appropriate tips for 100  $\mu$ L pipette
- Laboratory samples
- Pipette stand or rack
- Work surface or pipetting station

### **Safety Precautions:**

- Read and understand the user manual and safety guidelines for the 100  $\mu$ L Micropipette before operation.
- Wear appropriate personal protective equipment (PPE) such as gloves and a lab coat.
- Ensure that the micropipette is clean and calibrated before use.
- Handle samples with care to avoid spills or contamination.
- Avoid using excessive force when operating the micropipette to prevent damage.

### **Setup:**

- Ensure that the micropipette is set to the correct volume (100  $\mu$ L) according to the experiment's requirements.
- Attach a compatible tip to the micropipette.
- Place the micropipette in a pipette stand or rack on the work surface.

### **Operation:**

- Gently press the plunger button to the first stop to draw the sample into the pipette tip.
- Position the pipette tip into the sample solution.
- Slowly release the plunger to the starting position to aspirate the correct volume.
- Transfer the sample to the desired destination (e.g., microcentrifuge tube, well plate) by gently pressing the plunger to the second stop.

- Hold the pipette in a vertical position for a few seconds to ensure complete sample delivery.
- Eject the used pipette tip into a designated waste container.

#### Shutdown:

- Release any remaining pressure in the pipette by gently pressing the plunger to the second stop without a tip.
- Store the micropipette in a designated area or pipette stand.
- Ensure that the micropipette is clean and free from any residual samples.
- Check and, if necessary, recalibrate the micropipette according to the manufacturer's guidelines.


#### Cleaning and Maintenance:

- Wipe the external surfaces of the micropipette with a mild detergent and a lint-free cloth.
- Use a designated cleaning solution for removing any residue on the pipette.
- Regularly check and replace the pipette tip to prevent cross-contamination.
- Follow the manufacturer's recommendations for periodic maintenance and calibration.

#### Emergency Procedures:

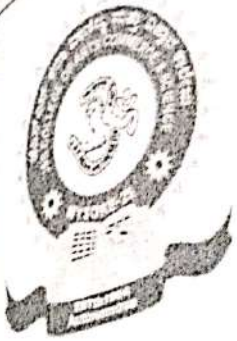
- In case of accidental sample contamination or spillage, clean the micropipette immediately using appropriate cleaning solutions.
- If the micropipette malfunctions or shows inconsistencies, remove it from service and report the issue to the laboratory supervisor.

Approved by:

 HOD

**Postgraduate Department of Zoology  
JSS College of Arts, Commerce & Science  
Ooty Road, MYSURU-570 025**

Date:



# JSS College of Arts, Commerce and Science

Autonomous under University of Mysore  
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POST GRADUATE DEPARTMENT OF ZOOLOG

## Standard Operating Procedure (SOP)

Standard Operating Procedure for Colorimeter (Manual)

SOP-ZOO-012

## Colorimeter (Manual)

**Purpose:** This SOP establishes guidelines for the proper usage and maintenance of the Manual Colorimeter in the laboratory.

### **Equipment:**

- Manual Colorimeter with wavelength filters
- Cuvettes (made of silica)
- Laboratory samples
- Distilled water (for blank readings)
- Lint-free wipes
- User manual for the colorimeter

### **Safety Precautions:**

- Wear appropriate personal protective equipment (PPE) such as gloves and safety goggles.
- Handle cuvettes and colorimeter components with care to prevent breakage.
- Avoid direct exposure of the colorimeter to liquids; use lint-free wipes for cleaning.
- Turn off the colorimeter when not in use to conserve power and extend the equipment's lifespan.

### **Setup:**

- Ensure that the colorimeter is placed on a clean and stable surface.
- Check that the power source is compatible with the colorimeter's requirements.
- Insert the appropriate wavelength filter into the colorimeter's filter holder.
- Turn the transmittance and absorbance knobs to the lowest settings before use.

### **Operation:**

- Turn on the colorimeter using the power switch.
- Insert a blank cuvette filled with distilled water into the sample slot for baseline readings.
- Adjust the transmittance knob to achieve 100% transmittance (zero absorbance) with the blank cuvette.

- Remove the blank cuvette and insert the cuvette containing the sample.
- Record the transmittance and absorbance values based on the colorimeter readings.
- If measuring multiple samples, repeat steps 2-5 for each sample, ensuring proper cleaning between measurements.

#### Shutdown:

- Turn off the colorimeter using the power switch.
- Remove the cuvette from the sample slot and clean it with distilled water or the appropriate solvent.
- Remove the wavelength filter from the filter holder and store it in a designated place.
- Disconnect the colorimeter from the power source.

#### Cleaning and Maintenance:

- Wipe the exterior surfaces of the colorimeter with a lint-free wipe.
- Clean cuvettes with distilled water or an appropriate solvent, followed by drying with a lint-free cloth.
- Periodically check and clean the wavelength filters using a lint-free wipe.
- Inspect the cuvettes for any scratches or defects and replace if necessary.

#### Emergency Procedures:

- In case of spills on the colorimeter, turn it off immediately and clean using appropriate procedures.
- If the colorimeter malfunctions or shows irregular readings, report the issue to the laboratory supervisor.
- In the event of breakage or damage to cuvettes, handle broken glass with care and dispose of it properly.

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POST GRADUATE DEPARTMENT OF ZOOLOG

## Standard Operating Procedure (SOP)

Standard Operating Procedure for Colorimeter (Automatic)

SOP-ZOO-013

## Colorimeter (Automatic)

**Purpose:** This SOP establishes guidelines for the safe and accurate usage of the Automatic Colorimeter with internal filters in the laboratory.

### **Equipment:**

- Automatic Colorimeter with internal filters (10 settings)
- Cuvettes (compatible with the colorimeter)
- Laboratory samples
- Distilled water (for blank readings)
- Lint-free wipes
- User manual for the colorimeter

### **Safety Precautions:**

- Wear appropriate personal protective equipment (PPE) such as gloves and safety goggles.
- Handle cuvettes and colorimeter components with care to prevent breakage.
- Avoid direct exposure of the colorimeter to liquids; use lint-free wipes for cleaning.
- Turn off the colorimeter when not in use to conserve power and extend the equipment's lifespan.

### **Setup:**

- Ensure that the colorimeter is placed on a clean and stable surface.
- Check that the power source is compatible with the colorimeter's requirements.
- Insert the appropriate filter setting for the experiment using the buttons on the colorimeter.
- Turn on the colorimeter.

### **Operation:**

- Press the auto-zero button for blank readings using distilled water or the appropriate blank solution.
- Insert the cuvette containing the sample into the sample slot.
- Record the absorbance or transmittance values displayed on the colorimeter.



- If measuring multiple samples, clean the cuvette and repeat steps 1-3 for each sample.
- Utilize the calibration button if necessary to ensure accurate readings.
- Use the mode button to switch between absorbance and transmittance modes as needed.

#### Shutdown:

- Turn off the colorimeter using the power switch.
- Remove the cuvette from the sample slot and clean it with distilled water or the appropriate solvent.
- If the colorimeter has a cover, close it to protect the internal components.
- Disconnect the colorimeter from the power source.

#### Cleaning and Maintenance:

- Wipe the exterior surfaces of the colorimeter with a lint-free wipe.
- Clean cuvettes with distilled water or an appropriate solvent, followed by drying with a lint-free cloth.
- Periodically check and clean the internal components of the colorimeter according to the manufacturer's guidelines.
- Inspect the cuvettes for any scratches or defects and replace if necessary.

#### Emergency Procedures:

- In case of spills on the colorimeter, turn it off immediately and clean using appropriate procedures.
- If the colorimeter malfunctions or shows irregular readings, report the issue to the laboratory supervisor.

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POST GRADUATE DEPARTMENT OF ZOOLOG

**Standard Operating Procedure  
(SOP)**

Standard Operating Procedure for pH Meter

SOP-ZOO-014

## pH meter

**Purpose:** This SOP establishes guidelines for the accurate and consistent use of the pH Meter in the laboratory, ensuring precise pH measurements and proper instrument care.

### **Equipment:**

- pH Meter
- pH Buffer Solutions (pH 4, 7, and 10)
- Distilled Water
- Electrode Storage Solution
- Lint-free Wipes
- Electrode Rinsing Bottle

### **Safety Precautions:**

- Wear appropriate personal protective equipment (PPE), including gloves and safety goggles.
- Handle pH buffers and solutions with care to prevent contamination.
- Avoid submerging the entire pH meter in liquids; ensure only the electrode is immersed during measurements.

### **Calibration:**

- Turn on the pH meter and allow it to warm up according to the manufacturer's instructions.
- Rinse the pH electrode with distilled water and blot it with a lint-free wipe.
- Immerse the electrode in the pH 7 buffer solution and wait for a stable reading.
- Adjust the pH meter to the reading of the buffer solution using the calibration controls.
- Repeat the process with pH 4 and pH 10 buffer solutions if necessary.
- Rinse the electrode with distilled water and store it in the electrode storage solution.

### Sample Measurement:

- Turn on the pH meter and allow it to stabilize.
- Rinse the pH electrode with distilled water and blot it with a lint-free wipe.
- Immerse the electrode in the sample solution, ensuring complete submersion.
- Wait for a stable pH reading; record the measurement.
- Rinse the electrode with distilled water between different samples.
- If measuring in a sequence, ensure proper electrode rinsing to avoid carryover contamination.

### Shutdown:

- Turn off the pH meter after use.
- Rinse the electrode with distilled water and blot it with a lint-free wipe.
- Store the electrode in the electrode storage solution.
- Clean the external surfaces of the pH meter with a damp lint-free wipe.

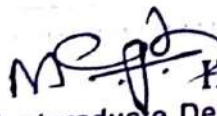
### Cleaning and Maintenance:

- Clean the pH electrode regularly with a mild detergent solution.
- Check the electrode for signs of damage or wear; replace if necessary.
- Follow the manufacturer's guidelines for electrode maintenance and storage.
- Periodically calibrate the pH meter to ensure accuracy.

### Emergency Procedures:

- In case of a malfunction or irregular readings, troubleshoot the pH meter according to the manufacturer's instructions.
- Report any issues to the laboratory supervisor for further assessment.

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POST GRADUATE DEPARTMENT OF ZOOLOG

**Standard Operating Procedure  
(SOP)**

Standard Operating Procedure for Conductivity Meter

SOP-ZOO-015

## Conductivity meter

**Purpose:** This SOP establishes guidelines for the accurate and consistent use of the Conductivity Meter in the laboratory, ensuring precise conductivity measurements and proper instrument care.

### **Equipment:**

- Conductivity Meter
- Calibration Solutions (low and high conductivity standards)
- Distilled Water
- Electrode Rinsing Bottle
- Lint-free Wipes

### **Safety Precautions:**

- Wear appropriate personal protective equipment (PPE), including gloves and safety goggles.
- Handle calibration solutions and sample solutions with care to prevent contamination.
- Avoid submerging the entire conductivity meter in liquids; ensure only the electrode is immersed during measurements.

### **Calibration:**

- Turn on the conductivity meter and allow it to warm up according to the manufacturer's instructions.
- Rinse the conductivity electrode with distilled water and blot it with a lint-free wipe.
- Immerse the electrode in the low conductivity standard solution and wait for a stable reading.
- Adjust the conductivity meter to the reading of the low standard using the calibration controls.
- Repeat the process with the high conductivity standard solution if necessary.
- Rinse the electrode with distilled water and store it properly.

### Sample Measurement:

- Turn on the conductivity meter and allow it to stabilize.
- Rinse the conductivity electrode with distilled water and blot it with a lint-free wipe.
- Immerse the electrode in the sample solution, ensuring complete submersion.
- Wait for a stable conductivity reading; record the measurement.
- Rinse the electrode with distilled water between different samples.
- If measuring in a sequence, ensure proper electrode rinsing to avoid carryover contamination.

### Shutdown:

- Turn off the conductivity meter after use.
- Rinse the electrode with distilled water and blot it with a lint-free wipe.
- Store the electrode in the provided storage solution.
- Clean the external surfaces of the conductivity meter with a damp lint-free wipe.


### Cleaning and Maintenance:

- Clean the conductivity electrode regularly with a mild detergent solution.
- Check the electrode for signs of damage or wear; replace if necessary.
- Follow the manufacturer's guidelines for electrode maintenance and storage.
- Periodically calibrate the conductivity meter to ensure accuracy.

### Emergency Procedures:

- In case of a malfunction or irregular readings, troubleshoot the conductivity meter according to the manufacturer's instructions.
- Report any issues to the laboratory supervisor for further assessment.

Approved by:



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POST GRADUATE DEPARTMENT OF ZOOLOG

## Standard Operating Procedure (SOP)

Standard Operating Procedure for Horizontal Gel  
Electrophoresis Unit

SOP-ZOO-016





## Horizontal Gel electrophoresis unit

**Purpose:** This SOP establishes guidelines for the safe and effective use of the Horizontal Gel Electrophoresis Apparatus in the laboratory, ensuring accurate separation of nucleic acids and proteins.

### **Equipment:**

- Horizontal Gel Electrophoresis Apparatus
- Agarose Gel
- DNA or Protein Samples
- DNA Loading Dye (if applicable)
- Electrophoresis Buffer
- Power Supply
- Gel Staining Solution (if applicable)
- Gel Documentation System (if applicable)

### **Safety Precautions:**

- Wear appropriate personal protective equipment (PPE), including gloves and safety goggles.
- Handle electrophoresis buffer and staining solutions with care.
- Ensure that the power supply is properly grounded.

### **Setup:**

- Place the gel in the casting tray, ensuring that it is level and without bubbles.
- Pour electrophoresis buffer into the gel tank to cover the gel.
- Load the DNA or protein samples into the wells using appropriate loading tips.
- Running Electrophoresis:
  - Connect the gel tank to the power supply.
  - Set the desired voltage and run time according to the experiment.
  - Monitor the electrophoresis process; stop if excessive heat is generated.
  - Once completed, turn off the power supply and disconnect the apparatus.

#### Gel Staining (if applicable):

- Carefully remove the gel from the casting tray
- Immerse the gel in the staining solution for the recommended duration
- Destain the gel as needed to visualize bands clearly.

#### Documentation:

- Record the gel composition, electrophoresis conditions, and running time.
- Document any deviations from the standard protocol.
- If using a gel documentation system, capture images of the gel.

#### Shutdown:

- Disassemble the gel apparatus carefully.
- Dispose of used gel according to laboratory waste disposal guidelines.
- Clean the gel tank, casting tray, and other components with a mild detergent.


#### Maintenance:

- Regularly inspect the gel apparatus for signs of wear or damage.
- Clean the electrode and other metal components with a suitable cleaning solution.
- Store the gel apparatus in a dry and cool environment.

#### Emergency Procedures:

- In case of a power outage, record the running time and voltage used.
- In the event of excessive heat or unusual smells, stop electrophoresis immediately.
- Report any equipment malfunctions to the laboratory supervisor.

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POST GRADUATE DEPARTMENT OF ZOOLOGY

## Standard Operating Procedure (SOP)

Standard Operating Procedure for Vertical Gel Electrophoresis  
Unit  
SOP-ZOO-017

## Vertical Gel electrophoresis Unit

**Purpose:** This SOP establishes guidelines for the safe and effective use of the Vertical Gel Electrophoresis Apparatus in the laboratory, ensuring accurate separation of nucleic acids and proteins.

### **Equipment:**

- Vertical Gel Electrophoresis Apparatus
- Agarose Gel
- DNA or Protein Samples
- DNA Loading Dye (if applicable)
- Electrophoresis Buffer
- Power Supply
- Gel Staining Solution (if applicable)
- Gel Documentation System (if applicable)

### **Safety Precautions:**

- Wear appropriate personal protective equipment (PPE), including gloves and safety goggles.
- Handle electrophoresis buffer and staining solutions with care.
- Ensure that the power supply is properly grounded.

### **Setup:**

- Assemble the vertical gel apparatus according to the manufacturer's instructions.
- Prepare the gel by pouring it between the glass plates; ensure no bubbles are present.
- Load the DNA or protein samples into the wells using appropriate loading tips.

### **Running Electrophoresis:**

- Connect the gel apparatus to the power supply.
- Set the desired voltage and run time according to the experiment.
- Monitor the electrophoresis process; stop if excessive heat is generated.
- Once completed, turn off the power supply and disconnect the apparatus.

### **Gel Staining (if applicable):**

- Carefully disassemble the gel apparatus.
- Immerse the gel in the staining solution for the recommended duration.
- Destain the gel as needed to visualize bands clearly.

### Documentation:

- Record the gel composition, electrophoresis conditions, and running time.
- Document any deviations from the standard protocol.
- If using a gel documentation system, capture images of the gel.

### Shutdown:

- Disassemble the gel apparatus carefully.
- Dispose of used gel according to laboratory waste disposal guidelines.
- Clean the glass plates and other components with a mild detergent.

### Maintenance:

- Regularly inspect the gel apparatus for signs of wear or damage.
- Clean the glass plates and electrode with a suitable cleaning solution.
- Store the gel apparatus in a dry and cool environment.

### Emergency Procedures:

- In case of a power outage, record the running time and voltage used.
- In the event of excessive heat or unusual smells, stop electrophoresis immediately.
- Report any equipment malfunctions to the laboratory supervisor.

Approved by:



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