SONOPANT DANDEKAR ARTS, V.S. APTE COMMERCE AND M.H. MEHTA SCIENCE COLLEGE, PALGHAR

Standard Operating Procedure

Department of Botany

Prepared by

Department of Botany

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Botany Department Laboratories Information

Sr. No.	Laboratory No.	Laboratory Name	Floor	Area in sq feet
1	26	Main Lab	2nd	720 sq feet
2	29	MSc Lab	2nd	720 sq feet
3	30	TYBSc Lab	2nd	351.33 sq feet
4	-	Teachers Staff Room	2nd	300 sq feet
5	-	Research Lab	2nd	300 sq feet

List of Laboratory Instruments

Sr No.	List of Instruments	Quantity
1	BOD incubator	1
2	Bacteriological Lab Incubator	1
3	Autoclave vertical	1
4	Water bath	2
5	Round Hot Plate	1
6	Oven Digital	1
7	Muffle Furnace	2
8	Distillation Unit	1
9	Centrifuge	1
10	Laminar Air Flow	1
11	Colorimeter	2
12	pH meter	1
13	Digital Weighing balance	2
14	Turbidity Meter	1
15	Digital Photo Electric Colorimeter	1
16	Conductivity Meter	1
17	Mixer and Grinder	1

Material Handling Procedures

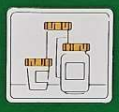
- Whether you're working with Chemicals or biological solutions, pills, powders, or other substances, all of these must be handled with care to protect yourself and others.

- Prepare them with caution by wearing gloves and related protective gear and working in well-ventilated areas.

- Identify them clearly with labels.

LAB SAFETY GUIDELINES

Wear safety goggles, lab aprons or coats, and protective gloves.



Monitor your experiment thoroughly.

Do not eat or drink inside the laboratory.

Handle chemicals, glassware, and equipment with care.

Know what to do in case of an emergency.

Ensure cleanliness inside the laboratory.

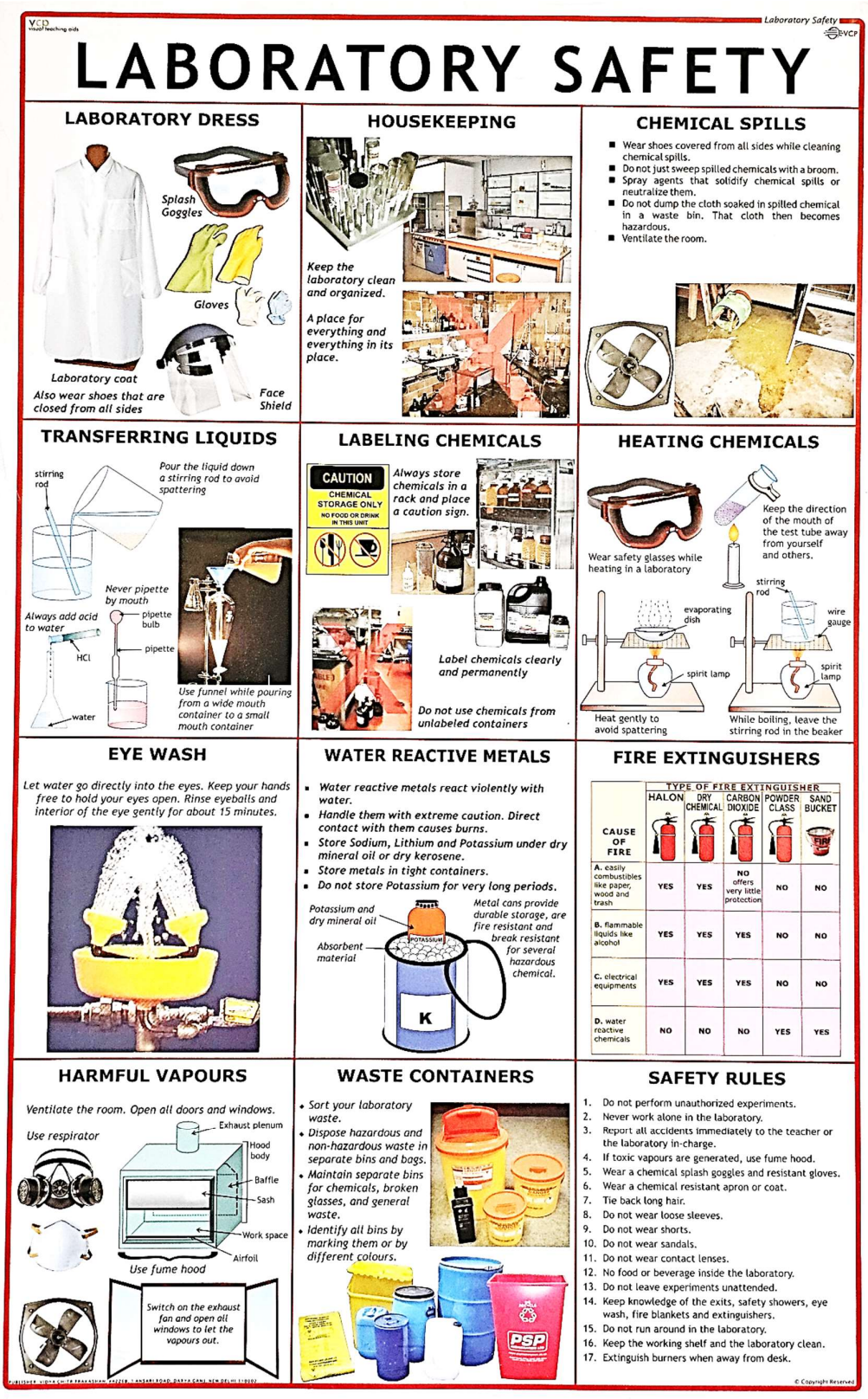
Do not leave your experiments unattended.

Dispose waste properly.

Read and check the labels before using any chemical.

Notify the supervisor if you encounter incidents and broken equipment.

IN CASE OF EMERGENCY


Laboratory Safety
LABORATORY SAFETY
LABORATORY DRESS
Splash Goggles
Gloves
Laboratory coat
Also wear shoes that are closed from all sides
Face Shield
HOUSEKEEPING
Keep the laboratory clean and organized.
A place for everything and everything in its place.
CHEMICAL SPILLS
Wear shoes covered from all sides while cleaning chemical spills.
Do not just sweep spilled chemicals with a broom.
Spray agents that solidify chemical spills or neutralize them.
Do not dump the cloth soaked in spilled chemical in a waste bin. That cloth then becomes hazardous.
Ventilate the room.
TRANSFERRING LIQUIDS
stirring rod
Pour the liquid down a stirring rod to avoid spattering
Never pipette by mouth
Always add acid to water
pipette bulb
pipette
HCl
water
Use funnel while pouring from a wide mouth container to a small mouth container
LABELING CHEMICALS
CAUTION
CHEMICAL STORAGE ONLY
NO FOOD OR DRINK IN THIS UNIT
Always store chemicals in a rack and place a caution sign.
Label chemicals clearly and permanently
Do not use chemicals from unlabeled containers
HEATING CHEMICALS
Wear safety glasses while heating in a laboratory
Keep the direction of the mouth of the test tube away from yourself and others.
evaporating dish
spirit lamp
stirring rod
wire gauge
spirit lamp
Heat gently to avoid spattering
While boiling, leave the stirring rod in the beaker
EYE WASH
Let water go directly into the eyes. Keep your hands free to hold your eyes open. Rinse eyeballs and interior of the eye gently for about 15 minutes.
WATER REACTIVE METALS
Water reactive metals react violently with water.
Handle them with extreme caution. Direct contact with them causes burns.
Store Sodium, Lithium and Potassium under dry mineral oil or dry kerosene.
Store metals in tight containers.
Do not store Potassium for very long periods.
Potassium and dry mineral oil
Absorbent material
POTASSIUM
K
Metal cans provide durable storage, are fire resistant and break resistant for several hazardous chemical.
FIRE EXTINGUISHERS
TYPE OF FIRE EXTINGUISHER
CAUSE OF FIRE
HALON
DRY CHEMICAL
CARBON DIOXIDE
POWDER CLASS
SAND BUCKET
A. easily combustibles like paper, wood and trash — YES | YES | NO offers very little protection | NO | NO
B. flammable liquids like alcohol — YES | YES | YES | NO | NO
C. electrical equipments — YES | YES | YES | NO | NO
D. water reactive chemicals — NO | NO | NO | YES | YES
HARMFUL VAPOURS
Ventilate the room. Open all doors and windows.
Use respirator
Exhaust plenum
Hood body
Baffle
Sash
Work space
Airfoil
Use fume hood
Switch on the exhaust fan and open all windows to let the vapours out.
WASTE CONTAINERS
Sort your laboratory waste.
Dispose hazardous and non-hazardous waste in separate bins and bags.
Maintain separate bins for chemicals, broken glasses, and general waste.
Identify all bins by marking them or by different colours.
PSP
SAFETY RULES
1. Do not perform unauthorized experiments.
2. Never work alone in the laboratory.
3. Report all accidents immediately to the teacher or the laboratory in-charge.
4. If toxic vapours are generated, use fume hood.
5. Wear a chemical splash goggles and resistant gloves.
6. Wear a chemical resistant apron or coat.
7. Tie back long hair.
8. Do not wear loose sleeves.
9. Do not wear shorts.
10. Do not wear sandals.
11. Do not wear contact lenses.
12. No food or beverage inside the laboratory.
13. Do not leave experiments unattended.
14. Keep knowledge of the exits, safety showers, eye wash, fire blankets and extinguishers.
15. Do not run around in the laboratory.
16. Keep the working shelf and the laboratory clean.
17. Extinguish burners when away from desk.
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Centrifuge

- Ensure that the instrument is clean and free from dust
- Ensure that all the knobs are in normal position
- Open the upper lid by releasing the lock and lifting it up
- Place the centrifuge tubes in the compartment provided for it
- Switch “ON” the mains
- Set the required time by using adjustment knob
- Adjust the RPM of the machine with the help of adjustment knob
- After completion of centrifugation time, a buzzer will beep, which indicates the completion of cycle
- After a beep, a motor will automatically cut off and RPM come down to zero
- Switch off the mains

Bacteriological incubator

- Switch on the main switch then the cabinet switch
- Set the require temperature by pressing the “Set knob” and “Soft keys”
- Monitor the temperature
- Control the temperature every day as by the following procedure
- Record the temperature which is displayed on the controller
- Monitor the temperature displayed on the digital screen. The temperature should not deviate by 2^0C

Colorimeter

- Press the ON button on the Colorimeter to select the correct wavelength for your experiment (Ex: 430 nm, 470 nm, 565 nm, or 635 nm)Allow the Colorimeter to warm up for about five minutes before calibrating
- Choose the right filter
- Select the appropriate mode, i.e. % transmittance or absorbance
- Insert the test tube containing the "Empty" or "Reference" solution
- Auto zero with blank solution
- Remove the test tube containing the blank solution and introduce the sample solution
- Note the reading

Laminar air flow

- Ensure that the instrument is clean and free from dust
- Adjust the three pin plug and supply the power
- Switch on the mains
- Turn on the switch of UV light; leave the UV on for at least 30 minutes
- Turn OFF the UV light
- Turn ON the switch of visible light
- Turn ON the switch of Air Flow
- Proceed for the experiment

BOD incubator

- Switch “ON” the instrument (if Instrument is off)
- Set required temperature with the help of Coarse and finally with the help of fine adjustment
- Digital display will show the desired temperature
- Ensure that the door of the incubator is properly closed and does not loosen during operation

- Ascertain and set the points at which calibration is required
- Maintain Logbook of BOD Incubator

Hot Air Oven

- Switch on the mains and the instrument and adjust the required temperature by using a thermostat.
- Keep the samples in the space provided
- Close the door of the apparatus by tightening the screws provided
- Check the required temperature is reached by the thermometer provided inside the oven
- Switch off the instrument and open the door for removing samples
- Close door after removing samples

Weighing balance

- Switch on the mains
- Open the door from one side
- Keep butter paper or sampling bag
- Close the door and press tare (T) key
- Open the door and put required sample
- Add the sample till you get desired weight on display and closed the door
- Open the door and take out the sample

Muffle Furnace

- Ensure that the instrument is connected to the power supply
- Switch ON the main power supply, glowing of red light at mains indicate the power supply
- Switch ON the instrument by ON position which leads to activation of green control bulb and temperature controller
- Set the temperature required by adjustment knob
- The digital display shows the actual temperature of furnace
- When the temperature reaches the setting point, the red light of the temperature controller automatically switched off and green light will glow
- The equipment is one ready for operation

General Laboratory Safety Guidelines

- Do not pour chemicals down drains, and do not utilize the sewer for chemical waste disposal.
- Keep all sink traps (including cup sink traps and floor drains) filled with water by running water down the drain at least monthly.
- Do not utilize fume hoods for evaporations and disposal of volatile solvents.
- Perform work with hazardous chemicals in a properly working fume hood to reduce potential exposures.
- Avoid working along in a building. Do not work alone in a laboratory if the procedures being conducted are hazardous.
- The permissible exposure limit (PEL) and the threshold limit values (TLV) must be observed in all areas. If exposure above a PEL or TLV is suspected for an ongoing process, please contact EHS immediately.
- Laboratory employees should have access to a chemical inventory list, applicable safety data sheets (SDS), departmental laboratory safety manual, and relevant standard operating procedures.
- Access to laboratories and support areas such as stockrooms or specialized laboratories should be limited to approved personnel only.
- All equipment should be regularly inspected for wear or deterioration.
- Equipment should be maintained according to the manufacturer's requirements and records of certification, maintenance, or repairs should be maintained for the life of the equipment.
- Designated and well-marked waste storage locations are necessary.

- No cell phone or ear bud usage is allowed in the active portion of the laboratories or during experimental operations.
- Clothing made of synthetic fibers should not be worn while working with flammable liquids or when a hazard is present as these materials tend to melt and stick to exposed skin.
- Laboratory coats should not be stored in offices or break rooms as this spreads contaminates to other areas.
- Computers and instrumentation should be labeled to indicate whether gloves should be worn or not. Inconsistent glove use around keyboards is a source of potential contamination.
- Avoid wearing jewelry in the lab as this can post multiple safety hazards