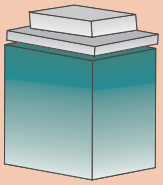
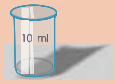
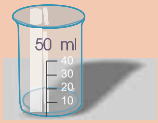
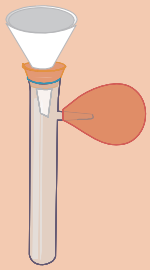
Chapter 2

2.1 Description of Kit Items

S.No.	Item Name (Quantity/ kit)	Figure/Setup	Uses
1.	Wooden box with revolving top (1)		1. Storage box opens on both sides. Contains necessary apparatus for doing experiments. 2. Revolving top containing dispensing bottles and vials for easy access to chemicals.
2.	Microbeaker (10 mL) (12)		1. As a container for keeping liquids.
3.	Beaker (50 mL) (3)		1. As a container for use in electrochemical experiments, thermochemistry experiments preparation of salts, etc.
4.	Micro-filtration unit (2)		**Steps for use** 1. Bore the rubber cork to fit the stem of Hirsch funnel. 2. Cut the filter paper to fit the mesh of the funnel. The size should exactly fit the mesh, neither big nor small. 3. Fit the cork with funnel in the mouth of the boiling tube (having a side tube). 4. Transfer the solution to be filtrated to the funnel. 5. Press the bulb with hand to evacuate it and place it on the side tube of the boiling tube while keeping it pressed. 6. Release the pressure. The bulb will suck the air inside the boiling tube allowing fast filtration.

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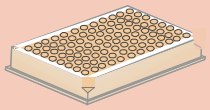
5.	Watch glass (2)		1. The watch glass is used to hold solids when being weighed. 2. It should never be heated.
6.	Micro test plate (Well plate) (4)		1. Flat plate with multiple "wells" used as micro test tubes. 2. Contains 96 rectangular matrix. 3. Each well of a micro plate typically holds somewhere between a few to a few hundred microlitres of liquid. 4. Use these wells by placing a few drops of test solution and reagent. 5. Clean the wells with jet of water from wash bottle and dry it with cotton swab. 6. A number of tests can be done without bothering to clean the wells after one test only. But don't forget to clean the wells at the end of the experiment. 7. Do not heat the micro test plate.
7.	Micro measuring cylinder (2)		1. To measure the volume of a liquid up to 10 mL. 2. To conduct activities requiring measurement of rise or fall in the level of a liquid.

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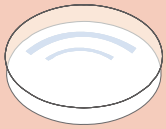
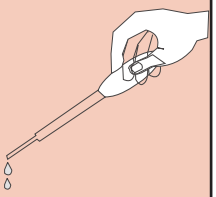
8.	Micro burette (4)		1. The micro burette has 5 mL capacity with the least count of 0.2 mL. At the narrow end of the burette, a microtip is attached with the help of plastic tube. Microtip delivers about 78 drops in 1 mL of solution. 2. Two burettes are used to avoid the use of a pipette and are fixed in the stand. 3. Pour the liquid slowly and make sure that no air bubble remains inside the burettes.
9.	Petri dish (2)		1. A shallow glass round dish used for chromatography.
10.	Micro test tubes (24)		1. As a container for keeping and testing small quantities of liquids. 2. To boil water over the micro burner.
11.	Pasteur pipette (20)		1. Made of plastic and also known as dropper. 2. Used to transfer small amounts of liquids.

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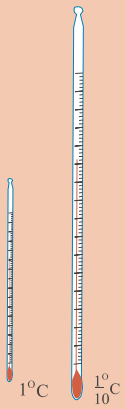
12.	Glass rod (2)		1. Used as a stirrer. 2. Used to pour liquid on to the filter paper during filtration.
13.	Micro titration flask (4)		1. Used for titration.
14.	Capillary tubes (1 box)		1. Used for melting point and boiling point determination.
15.	Thermometer (1 each)		1. Thermometer (0°C to 250°C) with 1°C least count for boiling point and melting point determination. 2. Thermometer (0°-60°C) (Least count 0.1°C) for thermochemistry experiments
16.	Stirrer (2)		1. Circular end is used to stir a mixture or a solution in the calorimeter. 2. The mounted stirrer is inserted in the foam lid of the calorimeter surrounding the thermometer.

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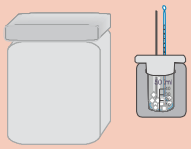
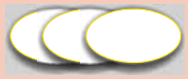
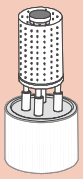
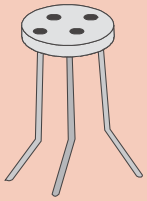
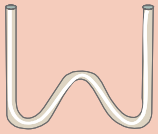
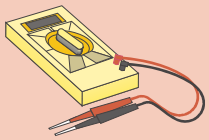
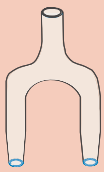
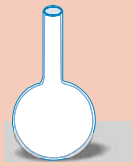
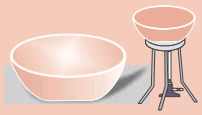
17.	Calorimeter (1)		1. Device used for measuring the enthalpy of chemical reactions or physical changes. 2. A 50 mL beaker is fixed in the foam container with the lid.
18.	Circular Whatman paper (20 pieces)		1. Used for filtering the substances or product of a chemical reaction or in chromatography, etc.
19.	Kerosene burner (2)		1. Used for heating and exposing items to flame. 2. The device safely burns a continuous stream of kerosene/gas. 3. To use kerosene burner, fix the lid containing wicks to the container having kerosene oil. Fix inner chimney to the lid. Light the burner. Fix outer chimney to the lid. A blue flame will appear after a few minutes.
20.	Tripod (2)		1. Used for keeping the beaker, test tubes or chaina dish in position for heating (No wire gauze is put over the tripod stand).

S.No.	Item Name (Quantity/kit)	Figure/Setup	Uses
21.	W-Tube (10)		1. In one of the outer sides of W-tube, a few mg of solid or few drops of liquid under test are transferred. In the other arm, transfer a few drops of reagent (e.g. $KMnO_4$ solution) that would react with the gas generated in the first arm. The reagent that would react with the test sample is then transferred as one or two drops with the help of another dropper into the first arm. The stem of the dropper would make this side airtight. 2. The generated gas would bubble through the liquid reagent in the other side showing the chemical change. 3. Used in the reactions such as to test the and evolution of CO_2 and of SO_2 gases and in the test of ethylene. 4. Cleaning of W-tube is done by passing a stream of water from the wash bottle jet into one of the arms of the W-tube. The second arm should point towards the container in which the contents are to be drained.
22.	Multimeter (1)		1. To check the continuty of a wire and circuit. 2. To measure resistance, voltage, and current.

S.No.	Item Name	Figure/Setup	Uses
23.	Volumetric flask (2)		1. Used to make accurate solution by measuring a specific volume.
24.	Dropper with rubber bulb (3)		1. The dropper is used for transferring small amounts of a liquid from container to another. 2. Fix the rubber bulb to the small glass dropper.
25.	Salt bridge (2)		1. Consists of U-shaped glass tubes with upper side tube in the middle, filled with a relatively inert electrolyte, usually potassium chloride or sodium chloride. 2. Fix the bigger rubber bulb (same as used with filtration unit) or syringe to the upper side tube of U-tube. 3. Squeeze the bulb and dip the two ends of U-tube in the saturated solution of KCl. Release the pressure. The liquid will be filled in the U-tube. 4. Allows the flow of ions to maintain a balance in charge between the oxidation and reduction vessels while keeping the contents of each separate. With the charge difference balanced, electrons can flow once again, and the reduction and oxidation reactions can proceed.

S.No.	Item Name	Figure/Setup	Uses
26.	Dispensing bottles (30)		1. Used to keep the chemical reagents. 2. Open the cap and squeeze the bottle to dispense one or two drops. 3. Label the dispensing bottle.
27.	Vials (20)		1. Used as a container to store the solid chemicals.
28.	Round bottom flask (2)		1. Round-bottom flask is used in a variety of applications where the contents are heated or boiled in organic preparations.
29.	China dish (2)		1. Used to heat small quantities to very high temperatures. 2. Used as a water bath.
30.	Fusion tube (20)		1. To determine the boiling point of a substance.

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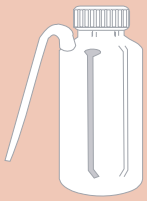
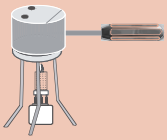
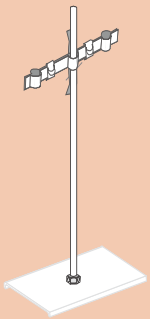
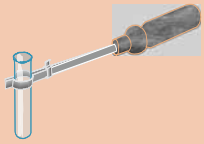
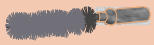
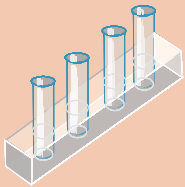
31.	Chromato-graphy jar with cork (1)		1. Put the cork on the open end of the jar, fit a hook in the inner side of the bottom of the cork so as to hang the Whatman paper strip. **Note:** strip width should be of $^{3}/_{4}$ of inch, the length must be shorter than that of the jar, so that it would not touch the inner walls of the jar.
32.	Wash bottles (2)		1. Used to contain water to wash the apparatus like micro test plate, W-tube, micro test tube etc.
33.	Micro spatula (2)		1. Used for transferring small amounts of solid
34.	pH paper (a pack)		1. Used to determine the pH or to study the change in pH of the chemical reaction.
35.	Alumimium block (1)		1. Used as a platform to heat the test tubes. 2. Used to hold the thermometer and measure the temperature. 3. The narrow slit is used to place the capillary tube for melting point determination. 4. Put the thermometer in one of the holes. 5. Put the fusion tube containing a liquid when boiling point is to be determined. Make sure the level of the liquid should be visible. Place an inverted capillary tube sealed at one end.

S.No.	Item Name (Quantity/kit)	Figure/Setup	Uses
36.	Forceps (2)		1. Used to pick and hold the objects.
37.	Two way burette clamp and stand (2)		1. Used to hold the burette upright during the titration.
38.	Micro test tube holder (2)		1. The holder is used to hold test tubes when they are hot and untouchable.
39.	Electrodes (1 pair)		1. Used to generate voltage in an electrochemical reaction.
40.	Micro test tube brush (2)		1. The test tube brush is used to easily clean the inside of a test tube.
41.	Micro test tube rack (2)		1. The test tube rack is used to hold test tubes.
42.	Micro funnel (2)		1. Used for filtering.