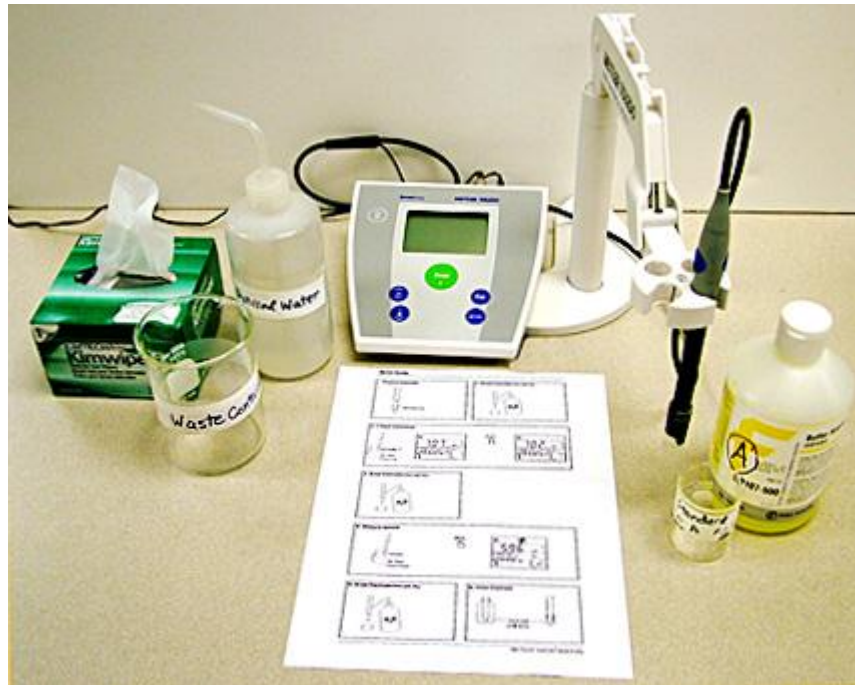


Operation of the Mettler S20 pH meter

Now let's turn our attention to the pH meter that you will be using in the laboratory.

For this you must be at a work station with the following materials:

1. Handout
2. pH meter and electrodes
3. Solution Bottle A pH = 7 Standardization Solution
4. Wash bottle (distilled water)
5. Beakers A and Waste (empty)
6. Kimwipes



As you work through this part of the module, you must perform certain operations with the pH meter. Do these operations carefully and only after you fully understand the operation so that the equipment will not be damaged since it represents a cost of about \$800.

Let's now examine the specific pH meter in front of you (Mettler Seven Easy S20 pH Meter).

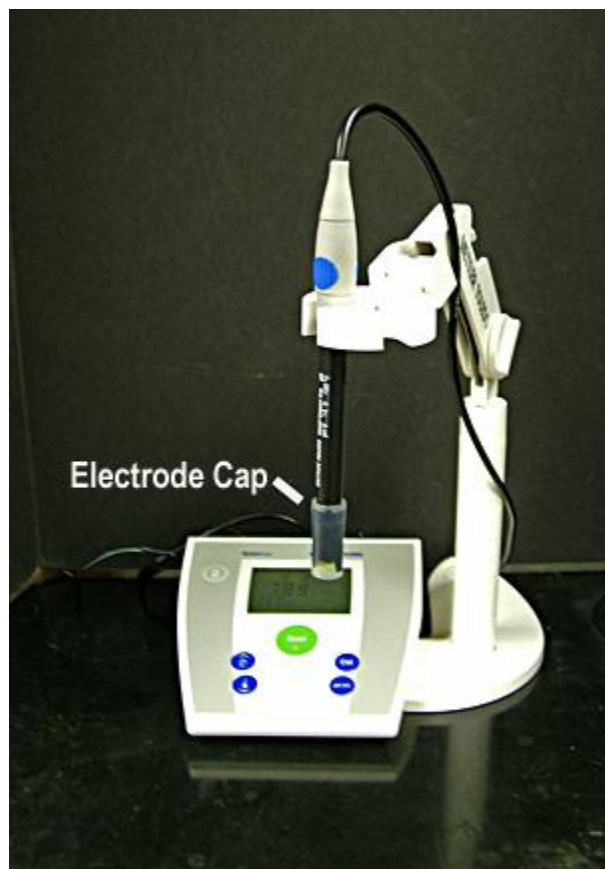


Figure 1: Mettler Easy Seven S20 pH Meter



Figure 2: Display S20 pH Meter

Initial Set Up

1. **Take the plastic cap off the bottom of the electrode.** Save the solution (3 M KCl) in the cap to store the electrode when finished. **Do NOT discard the liquid inside the plastic cap but retain for storage.**
2. **Plug the meter in, if needed,** and **press the ON/OFF button to turn the meter on.** The meter will do a quick self-check and the display will then show the pH, temperature and a number of other parameters.
3. **Check that pH is the mode,** shown by the pH on the upper right of the main Display box. If not, use the pH/mV button to toggle to pH.

Calibrate (1 point) the Meter (perform initially and check after extended use.)

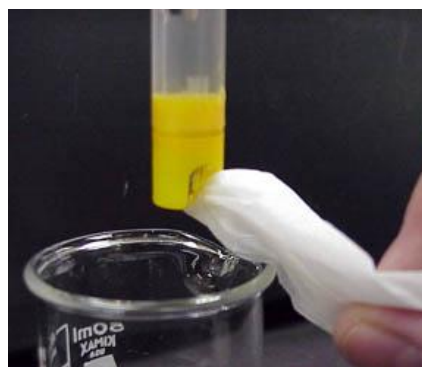
1. **Rinse the electrode with distilled water and pat dry with a KimWipe.**



Rinse the electrodes with distilled water from a wash bottle into an empty beaker.

Blot the electrodes dry with a Kimwipe. Do not rub!

This procedure should be carried out whenever the electrodes are transferred from one solution to another to minimize the chance of contamination.



2. Place the electrode in pH 7 buffer. (Be sure that the buffer series B1 is selected in the display box below the temperature box. If not, have the instructor adjust the selected series.)

Lower the electrodes into the standardization solution carefully so they do not strike the bottom of the beaker and break. If an experiment requires the use of a magnetic stirring bar in the solution whose pH is being measured, be careful that the bar does not hit the electrodes. A buffer solution is used as the standardization solution because its pH is known and it will maintain its pH in case of contamination as long as it is not excessive. A buffer solution of pH = 7 is commonly used although the



instrument should be standardized in the pH region of the unknown solutions.	
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3. Press the CAL button. When the decimal point in the pH display stops flashing, the meter is calibrated.

4. Take the electrode out of the buffer, rinse with distilled water and pat dry.

The system is now ready to measure pH values of other solutions.

Measurement of sample pH values (after calibration)

1. Place the electrode in the solution.

2. Press the READ button. When the decimal point in the pH display stops Flashing, the pH of the sample is shown on the display.

3. Take the electrode out of the solution, rinse with distilled water and pat dry.

NOTE: You must rinse and dry the electrode between each sample.

4. Repeat steps 1 through 3 to measure the pH of other samples.

5. When finished, rinse the electrode with distilled water and pat dry.

6. Place the plastic cap filled with 3 M KCl back on the electrode. The electrode must be stored in the solution in this cap!

7. Turn off the meter by pressing the OFF/ON button.