

## Measuring Soil pH in water

### Materials:

- 50mL centrifuge tubes
- Centrifuge tube holder
- 50mL beaker (to hold tube on scale)
- Deionized water (DIW)
- Hanna pH meter (multiparameter probe)
- pH standards
- Sample spoon
- Wipes for cleaning spoon
- Pencil
- Lab Notebook

### Procedure:

1. Remove the black cap from the pH meter
2. Turn the pH meter on. If it is not in pH mode (indicated in the top right of the display screen) set it to pH mode using the mode button.
3. Calibrate the pH meter using the standard pH solutions (pH 4 and 7 for acid to neutral soils)
  - a. Use the buffer solutions provided and pour into the plastic cups. Keep in an area as free as possible from contamination. To avoid waste, only put in the amount of buffer you need to cover the measurement part of the electrode. NEVER return buffer solutions to the bottles.
  - b. For calibration of the meter first calibrate with the 7 solution, and then the 4. Specific instructions for calibration are in the manual with the probe.
  - c. After calibration re-measure the buffer solutions and record the readings as the first set of 'standards' prior to measuring pH of your samples. As long as the values are within  $\sim 0.02-0.03$  of the buffer value then proceed with measuring your samples.
  - d. Note: Ensure that you rinse the pH electrode with DI water and blot dry prior to moving the electrode from buffer to buffer, buffer to sample, and especially before storing again.
4. Mix soil with DI water in a 1:2 ratio. For example, in a 50 mL beaker add soil (loosely, not packed in) to the 10 mL marker and then add DI water up to the 30 mL mark.
5. Either stir the soil and water or cap the tube and shake. Leave to stand for 10 min
6. Place electrode in the liquid above the soil (the supernatant of the soil/water mixture) and swirl until pH reading approximately stabilizes
  - a. Note: Do not let the pH probe sit in the soil/water mixture for an extended period of time.
7. Record the value in the notebook next to the sample number
8. Rinse the probe with DI water (from a wash bottle).
9. Take standard measurements (pH 4 and 7 for acid soils) after each series of approx. 20 soils. If necessary, re-calibrate before the next batch of samples.
10. Conduct this analysis in duplicate. We typically use 2 mm sieved soils.
11. When finished, rinse electrode thoroughly, turn off, and put cap back on.

**IMPORTANT:** Between each measurement rinse electrode with DI water (from a wash-bottle) and blot dry on paper towel or something similar. Having a large beaker to rinse into makes this much easier. **DO NOT RUB THE ELECTORDE WITH TOWEL BECAUSE THIS**

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WILL DAMAGE IT!! ALSO DO NOT LET THE PROBE SIT IN THE SOIL/WATER MIXTURE BECAUSE THIS WILL ALSO DAMAGE THE PROBE. Ensure the probe is properly cleaned at the end of the.