AIRMoN, pH and Conductivity Field Measurement

Items needed:

Sample to be measured (sample volume ≥ 50 mL)
Field Observer Form (FOF) for the sample to be measured
conductance cell
pH vials, 4
conductivity probe and meter
pH electrode and meter
pH 4.00 buffer solution
pH 7.00 buffer solution
Check Sample
electrode fill solution
conductivity standard

Precautions:

Field measurement of pH and conductivity should be performed only when the sample volume is at least 50 mL. If the sample volume is less than 50 mL, the entire sample should be shipped to the CAL for analysis.

All solutions must be at room temperature when measurements are made.

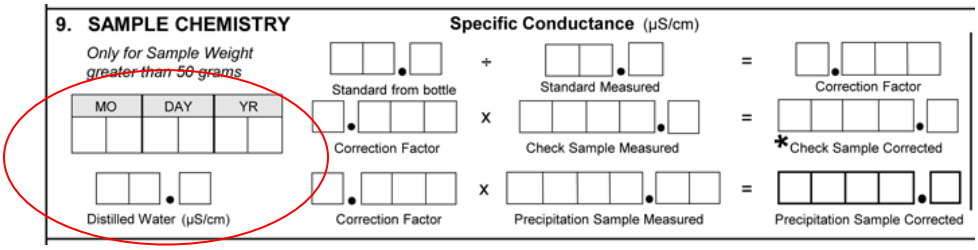
pH vials should remain bagged until use, and should be stored in a clean, dust-free environment.

Do not insert the conductivity probe or the pH electrode into the containers of test solutions (e.g., check sample, standard, or buffer solutions) as provided by the CAL.

Instructions - Conductivity:

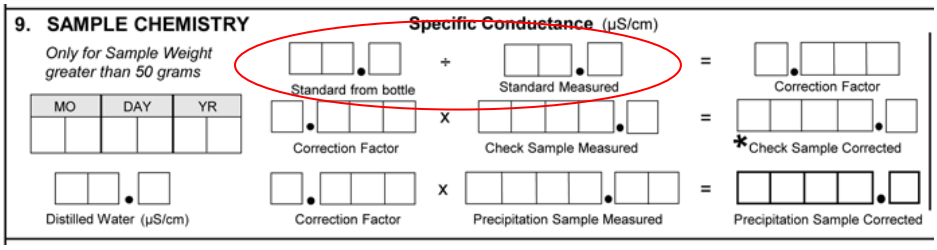
1. Rinse the conductance cell at least 3 times with distilled (or deionized) water.

2. Fill the conductance cell an additional time, and measure its conductivity. Record the value to the nearest tenth in Block 9 **Sample Chemistry** of the FOF. Also record the date of the measurement.

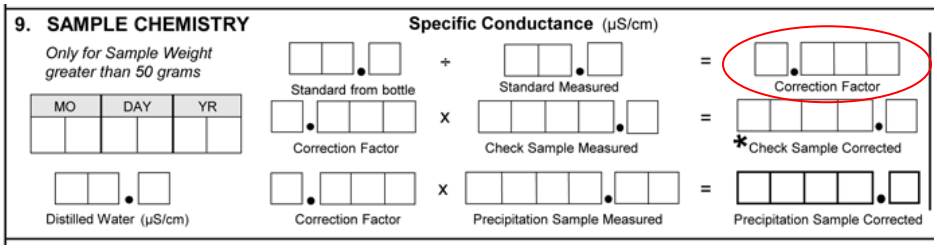


3. Rinse the conductance cell once with standard solution (provided by the CAL).

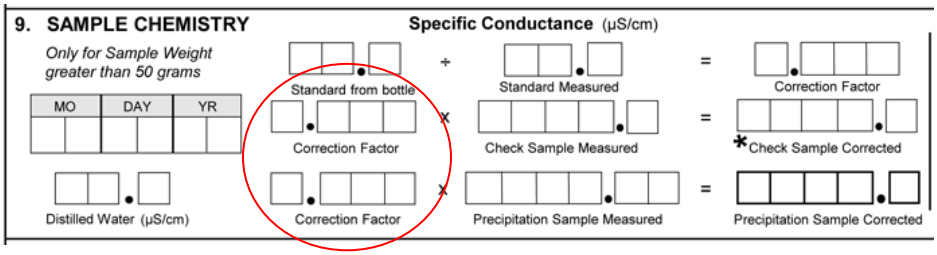
4. Fill the conductance cell a second time with standard solution, and measure its conductivity. In Block 9 **Sample Chemistry** of the FOF record both the target value (from the bottle) and the measured value. Both values should be recorded to the nearest tenth.



5. Calculate the *Correction Factor* by dividing the target value by the measured value. Enter this value in Block 9 Sample Chemistry of the FOF.



6. Enter the *Correction Factor* twice more in Block 9 **Sample Chemistry** of the FOF.

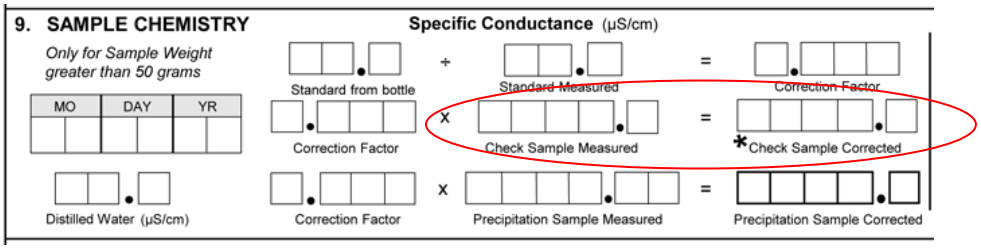


7. Rinse the conductance cell at least 3 times with distilled (or deionized) water.

8. Rinse the conductance cell once with check sample (provided by the CAL).

9. Fill the conductance cell a second time with check sample, and measure its conductivity. In Block 9 **Sample Chemistry** of the FOF, record the measured value to the nearest tenth.

10. Calculate the corrected check sample conductance by multiplying the measured value by the *Correction Factor*.

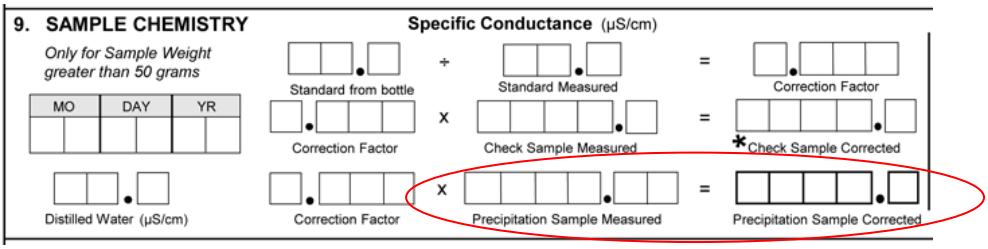


11. Rinse the conductance cell at least times with distilled (or deionized) water.

12. Rinse the conductance cell once with the precipitation sample.

13. Fill the conductance cell a second time with the precipitation sample, and measure its conductivity. In Block 9 **Sample Chemistry** of the FOF, record the measured value to the nearest tenth.

14. Calculate the corrected precipitation sample conductance by multiplying the measured value by the Correction Factor.



15. Repeat steps 11-14 for any additional precipitation samples to be measured.

16. Rinse the conductance cell with distilled (or deionized) water and store it until next use.

Instructions - pH:

1. Adjust the temperature control on the pH meter to match room temperature. If room temperature is not known, adjust the temperature control to 25°C.

2. Remove the soaker cap from the tip of the pH electrode. Use care not to damage the electrode.

3. Rinse the electrode with distilled (or deionized) water to remove any accumulated salts. Use a lint-free lab wipe (e.g., Kimwipe) to blot the tip of the electrode to remove excess water. Use care to avoid damage to the electrode.

4. Verify the level of the fill solution in the electrode. Add fill solution (provided by the CAL) if needed. If fill solution is added, shake the electrode to remove air bubbles. Again, use care not to damage the electrode. Rinse the electrode with distilled (or deionized) water after filling.

5. Fill a pH vial with pH 7.00 buffer solution (provided by the CAL). Insert the pH electrode into the vial to measure the pH of the buffer solution. Wait at least 10 seconds before recording the measurement to allow the reading to stabilize.

6. Discard the contents of the pH vial. Refill the pH Vial with pH 7.00 buffer solution. Do not rinse the pH vial between fillings.

7. Insert the pH electrode into the vial to measure the pH of the buffer solution. Again, wait at least 10 seconds before recording the measurement to allow the reading to stabilize.

8. Adjust the calibration (or standardize) control of the pH meter to read pH 7.00.

9. Rinse the electrode with distilled (or deionized) water.

10. Repeat Steps 5-7 using the pH 4.00 buffer solution (provided by the CAL) and a new pH vial. Retain the vial containing pH 7.00 buffer solution for use in Step 13.

11. Adjust the slope control of the pH meter to read pH 4.00.

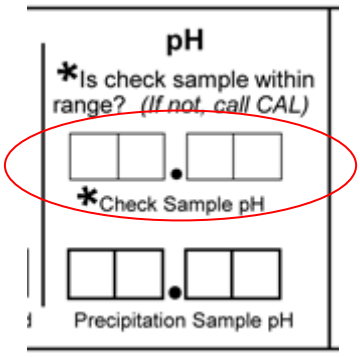
12. Rinse the electrode with distilled (or deionized) water.

13. Using the first vial, re-measure the pH of the pH 7.00 buffer solution. The reading must be 7.00 ± 0.03 pH units. If not, repeat Steps 5-9 using pH 7.00 buffer solution.

14. Using the second vial, re-measure the pH of the pH 4.00 buffer solution. The reading must be 4.00 ± 0.02 pH units. If not, repeat Steps 10-12 using pH 4.00 buffer solution.

15. If unable to achieve pH readings of 7.00 ± 0.03 and 4.00 ± 0.02, respectively, after repeating the calibration step, stop and contact the CAL for assistance.

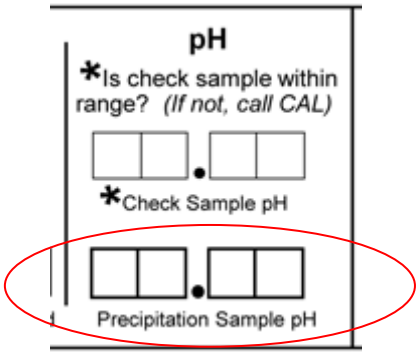
16. Using a new pH vial, repeat Steps 5-7 using the Check Sample (provided by the CAL). Record the measured value in Block 9 **Sample Chemistry** of the FOF.



17. The pH of the Check Sample must be within 0.10 pH units of the target value. If not, stop, and contact the CAL for assistance.

18. Rinse the electrode with distilled (or deionized) water.

19. Using a new pH vial, repeat Steps 5-7 using the precipitation sample. Record the measured value in Block 9 Sample Chemistry of the FOF.



20. Rinse the electrode with distilled (or deionized) water.

21. Cover the filling port of the electrode to prevent evaporation and crystallization of the electrode fill solution. A piece of Parafilm may be used to cover the filling port.

22. Replace the soaker cap on the tip of the pH electrode, and store the electrode for next use.

23. Discard the used solutions (buffer, Check, and sample) and vials.