Precipitation pH Using pH Paper and Large Salt Crystals

Lab Guide

Task

Measure the pH of your precipitation using pH paper and large salt crystals.

What You Need

- ❑ *Integrated 1-Day Data Sheet*
- ❑ Large salt crystals (0.5 mm to 2.0 mm in diameter)
- ❑ Tweezers
- ❑ Stirring rod or spoon
- ❑ pH paper
- ❑ 3 Clean 100 mL beakers or cups
- ❑ Covered sample jar containing at least 30 mL of rain or melted snow
- ❑ Latex gloves
- ❑ Pen or pencil
- ❑ Distilled water in wash bottle

In the Field

1. Pour a 50 mL (or less if you do not have 50 mL) sample of rain or melted snow from your sample jar into a clean beaker. You must have at least 30 mL of sample to measure pH.
2. Put on latex gloves.
3. Use tweezers to add one salt crystal into the beaker.
4. Stir the beaker's contents thoroughly with stirring rod or spoon until salt is dissolved.
5. Follow the instructions that came with the pH paper to measure the pH of the sample. Record the pH value on your *Data Sheet*.
6. If you have at least 30 mL of rain or melted snow remaining in your sample jar then repeat steps 1-5 to attain additional pH measurements. A total of 3 pH measurements is recommended providing there is sufficient rain or melted snow in the sample jar.
7. Calculate the average of the 3 pH measurements and record on your *Data Sheet*.
8. Check to make sure that each measurement is within 1.0 pH unit of the average. If they are not within 1.0 unit of the average, then repeat the measurements. If your measurements are still not within 1.0 pH units of the average, discuss possible problems with your teacher.
9. Discard used pH paper in a waste container and rinse the beakers and sample jar three times with distilled water.

Precipitation pH Using pH Paper and "Table" Salt

Lab Guide

Task

Measure the pH of your precipitation using pH paper and "table" salt.

What You Need

- ❑ *Integrated 1-Day Data Sheet*
- ❑ Finely ground "table" salt (crystals less than 0.5 mm in diameter)
- ❑ Salt card consisting of 4 mm and 5 mm circles drawn on a card or piece of paper
- ❑ Stirring rod or spoon
- ❑ pH paper
- ❑ 3 clean 100 mL beakers or cups
- ❑ Covered sample jar containing at least 30 mL of rain or melted snow
- ❑ Latex gloves
- ❑ Pen or pencil
- ❑ Distilled water in wash bottle

In the Field

1. Pour a 50 mL (or less if you do not have 50 mL) sample of rain or melted snow from your sample jar into a clean beaker. You must have at least 30 mL of sample to measure pH.
2. Put on latex gloves.
3. Sprinkle salt onto the appropriate circle on your *salt card*. If your rain or melted snow sample is 40-50 mL, use the large 5 mm circle on the *salt card*. If your rain or melted snow sample is 30-40 mL, use the small 4 mm circle.
4. Fill the appropriate circle with a single layer of salt. Remove any excess salt from the *salt card*.
5. Pour the salt covering the circle on your *salt card* into the beaker.
6. Stir the beaker's contents thoroughly with stirring rod or spoon until salt is dissolved.
7. Follow the instructions that came with the pH paper to measure the pH of the sample. Record the pH value on your *Data Sheet*.
8. If you have at least 30 mL of rain or snow left in your sample jar then repeat steps 1-7. Otherwise, repeat step 7. Continue until you have collected a total of 3 pH measurements.
9. Calculate the average of the 3 pH measurements and record on your *Data Sheet*.
10. Check to make sure that each measurement is within 1.0 pH unit of the average. If they are not within 1.0 unit of the average, then repeat the measurements. If your measurements are still not within 1.0 pH units of the average, discuss possible problems with your teacher.
11. Discard used pH paper in a waste container and rinse the beakers and sample jar three times with distilled water.

Precipitation pH Using pH Meter and Large Salt Crystals

Lab Guide

Task

Measure the pH of your precipitation using a pH meter and large salt crystals.

What You Need

- ❑ *Integrated 1-Day Data Sheet*
- ❑ Tweezers
- ❑ Large salt crystals
- ❑ Pen or pencil
- ❑ pH meter
- ❑ pH buffers 4, 7, and 10
- ❑ 3 Clean 100 mL beakers or cups (0.5 mm to 2.0 mm in diameter)
- ❑ Covered sample jar containing at least 30 mL of rain or melted snow
- ❑ Latex gloves
- ❑ Distilled water in wash bottle

In the Field

1. Put on latex gloves.
2. Calibrate your pH meter according to the instrument instructions, using the pH buffers. Be sure to use enough standard to completely cover the tip of the electrode.
3. Rinse electrode *thoroughly* with distilled water. Any remaining standard can contaminate your sample.
4. Pour a 50 mL (or less if you do not have 50 mL) sample of rain or melted snow from your sample jar into a clean beaker. You must have at least 30 mL of sample to measure pH.
5. Use tweezers to add one salt crystal to the beaker.
6. Stir the beaker's contents thoroughly with stirring rod or spoon until salt is dissolved.
7. Follow the instructions that came with the pH meter to measure the pH of the sample and record the measurement on your *Data Sheet*. (**Note:** the electrode must be completely covered with sample water).
8. If you have at least 30 mL of rain or snow left in your sample jar then repeat steps 4-7. Otherwise, repeat step 7. Continue until you have collected a total of 3 pH measurements.
9. Calculate the average of the 3 pH measurements and record on your *Data Sheet*.
10. Check to make sure that each measurement is within 0.2 pH units of the average. If they are not with 0.2 units of the average, repeat the measurements. If your measurements are still not within 0.2 pH units of the average, discuss possible problems with your teacher.
11. Rinse the beakers and sample jar three times with distilled water.

Precipitation pH Using pH Meter and "Table" Salt

Lab Guide

Task

Measure the pH of your precipitation using a pH meter and "table" salt.

What You Need

- ❑ *Integrated 1-Day Data Sheet*
- ❑ Finely ground "table" salt (crystals less than 0.5 mm in diameter)
- ❑ Salt card consisting of 4 mm and 5 mm circles drawn on a card or piece of paper
- ❑ Stirring rod or spoon
- ❑ pH meter
- ❑ pH buffers 4, 7, and 10
- ❑ 3 clean 100 mL beakers or cups
- ❑ Covered sample jar containing at least 30 mL of rain or melted snow
- ❑ Latex gloves
- ❑ Pen or pencil
- ❑ Distilled water in wash bottle

In the Field

1. Put on latex gloves.
2. Calibrate your pH meter according to the instrument instructions, using the pH buffers. Be sure to use enough standard to completely cover the tip of the electrode.
3. Rinse electrode *thoroughly* with distilled water. Any remaining standard can contaminate your sample.
4. Pour a 50 mL (or less if you do not have 50 mL) sample of rain or melted snow from your sample jar into a clean beaker. You must have at least 30 mL of sample to measure pH.
5. Sprinkle salt onto the appropriate circle on your *salt card*. If your rain or melted snow sample is 40-50 mL, use the large 5 mm circle of the *salt card*. If your rain or melted snow sample is 30-40 mL, use the small 4 mm circle.
6. Fill the appropriate circle with a **single** layer of salt. Remove any excess salt from the *salt card*.
7. Pour the salt covering the circle on your *salt card* into the beaker.
8. Stir the beaker's contents thoroughly with stirring rod or spoon until salt is dissolved.
9. Follow the instructions that came with the pH meter to measure the pH of the sample and record the measurement on your *Data Sheet*. (**Note:** the electrode must be completely covered with sample water)
10. If you have at least 30 mL of rain or snow left in your sample jar then repeat steps 4-9. Otherwise, repeat step 9. Continue until you have collected a total of 3 pH measurements.
11. Calculate the average of the 3 pH measurements and record on your *Data Sheet*.
12. Check to make sure that each measurement is within 0.2 pH units of the average. If they are not with 0.2 units of the average, repeat the measurements. If your measurements are still not within 0.2 pH units of the average, discuss possible problems with your teacher.
13. Rinse the beakers and sample jar three times with distilled water.