# 39 Drop pH Scale

**Introduction:**

The pH of a solution can be determined chemically or instrumentally. The chemical method uses an **indicator**, *a substance that changes color in some known pH range.* A Universal Indicator will produce an array of colors (red, orange, yellow, green, blue, purple, and colors in between) depending on the acidity of the solution being tested.

**Purpose:**

The purpose of this experiment is to produce a standard pH color chart to be used in determining the pH of several household products.

**Materials/Equipment:**

*Van provides: Teacher provides:*

|  |  |
| --- | --- |
| 24 well plate | Ammonia |
| Solution X | Baking Soda |
| Solution Y | Vinegar |
| Universal Indicator | Milk |
| Toothpicks | Sprite |
| pH paper | Distilled Water |
|  | Tap Water |

**Safety Considerations:**

1. Always wear goggles in the lab.
2. Carefully wash hands after handling solutions.

**Procedure:**

1. Placethe well plate on a piece of clean white paper.
2. Add drops of solution X and solution Y to the wells in rows A and B as indicated by the chart on the next page. Stir solutions with a toothpick. Be careful to control drops—DON’T miscount!
3. Add 5 drops of each household solution to separate wells in row D.
4. Add one drop of Universal Indicator to each well containing a solution. Stir with a toothpick.
5. Determine the pH values of the household solutions by comparison with the other wells.
6. Record your results on the chart.
7. Verify pH with pH (whole-range) paper.
8. Record results on the data table.

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Partner’s Name(s) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period \_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Well #**  **pH** (0.1)  drops **X**  drops **Y**  **color** | A1  **2.0**  *39*  *0* | A2  **3.0**  *35*  *4* | A3  **4.0**  *31*  *8* | A4  **5.0**  *27*  *12* | A5  **6.0**  *24*  *15* | A6  **7.0**  *20*  *19* |
| **Well #**  **pH** (0.1)  drops **X**  drops **Y**  **color** | B1  **8.0**  *17*  *22* | B2  **9.0**  *14*  *25* | B3  **10.0**  *11*  *28* | B4  **11.0**  *7*  *32* | B5  **12.0**  *3*  *36* | B6 |
|  | C1 | C2 | C3 | C4 | C5 | C6 |
| **Well #**  **pH** (0.1)  color  substance  Acid/Base?  pH paper color  pH paper # | D1  \_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_ | D2  \_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_ | D3  \_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_ | D4  \_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_ | D5  \_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_ | D6  \_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_ |

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Partner’s Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period \_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Questions:**

1. Which household solution was the most acidic? Which was the most basic?
2. Which substance was closest to neutral?
3. If you tested water, was it neutral? What was the reason for this observation?
4. Which do you think would be more accurate, a pH meter or your pH color indicator scale? Why do you think so?