

PROCEDURE

1. Clean and dry your well plates, and place them on top of a white sheet of paper. Tear each of the three pieces of neutral litmus paper into small squares.

Note: In order to get the right amount of a solution for a test, squeeze a pipet bulb and completely fill the bulb with liquid. Then “squirt” the contents of the pipet into a large “well” in the well plate.

2. Put one full “squirt” of HCl solution into each of 5 different wells on a well plate.

(a) Into the 1st well add a piece of litmus paper. **Record the paper’s colour** in the Data Table.

(b) Into the 2nd well add ONE drop of methyl red. **Record the solution’s colour** in the Data Table.

(b) Into the 3rd well add ONE drop of bromothymol blue. **Record the solution’s colour** in the Data Table.

(c) Into the 4th well add ONE drop of phenolphthalein. **Record the solution’s colour** in the Data Table.

(d) Into the 5th well add ONE drop of universal indicator. **Record the solution’s colour and its pH** in the Data Table.

3. Repeat step 2 of the Procedure using one full “squirt” of each of NaOH, NEUTRAL, A, B, C, D, E, F and G in different wells.

DISCUSSION QUESTIONS

1. What colour is each of neutral litmus, methyl red, bromothymol blue, phenolphthalein and universal indicator in

(a) a highly acidic solution?

(b) a highly basic solution?

(c) a neutral solution?

2. Which TWO of neutral litmus, methyl red, bromothymol blue, phenolphthalein and universal indicator allow you to tell whether a solution is neutral (as opposed to being slightly to highly acidic or slightly to highly basic)?

3. Only one of the unknown solutions is neutral; all the others are either acidic or basic. Which of the unknown solutions (A to G) are acids, which is neutral and which are basic?

4. Only ONE pH is “NEUTRAL”; all other pH’s refer to slightly to highly acidic or slightly to highly basic solutions.

(a) What is the pH of a neutral solution?

(b) Look at ALL the substances in your Data Table that bromothymol blue indicated are **acids**. According to your data, **ACIDIC** solutions are in what **pH RANGE**?

(c) Look at ALL the substances in your Data Table that bromothymol blue indicated are **bases**. According to your data, **BASIC** solutions are in what **pH RANGE**?

5. Which of the following solutions are acidic, which are neutral and which are basic?

Solution	pH of Solution	Is the Solution Acidic, Neutral or Basic?
P	9.5	
Q	5.5	
R	10.5	
S	7.0	
T	4.5	

6. If you have to decide whether a solution is acidic, basic or neutral, and can only use one indicator, which of the indicators in this lab will you use? Justify your answer with a well-reasoned statement using complete sentences. Make it clear what you see that lets you know whether a solution is acidic, what you see that lets you know whether a solution is basic, and what you see that lets you know whether a solution is neutral. (There is more than one possible correct indicator.)