

Name: _____

Chem 9, Section: _____

Lab Partner: _____

Experiment Date: _____

Acids, Bases and pH

Part A: Color of Red Cabbage Indicator with pH standards

pH standard	Color with Cabbage Indicator
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Parts B and C: pH of Everyday Chemicals

Chemical	Color with Indicator	Qualitative pH (to 0.5)	Acidic, Basic, or Neutral?	Quantitative pH (to 0.01)
soda				
shampoo				
ammonia cleaner				
bleach				
laundry detergent				
lemon juice				
vinegar				
bottled water				
0.1 M HCl				
0.1 M NaOH				

Part D: Effect of Buffers on pH

Tube	Contents	Initial pH	Chemical Added	New pH	pH change
A	Water		HCl		
B	Buffer solution (acetic acid and sodium acetate)		HCl		
C	Water		NaOH		
D	Buffer solution (acetic acid and sodium acetate)		NaOH		

Questions

- 1) What is an acidic solution? What is a basic solution?
- 2) What is an alkaline solution?
- 3) What is a pH indicator? What are common uses of pH indicators?
- 4) Write the mathematical equation that relates pH value and H^+ ion concentration:

Circle correct choice:

Acids have (high OR low) pH, and (high OR low) H^+ ion concentration.

Bases have (high OR low) pH, and (high OR low) H^+ ion concentration.

- 5) When the H^+ ion concentration is expressed in brackets $[H^+]$, what are the units of the for H^+ ion concentration?

6) Does a solution with **pH 10** have equal, less or more H^+ ions than of a solution with a **pH 6**?

Calculate the $[H^+]$ for both solutions, include units in your answer:

For pH 10, $[H^+] =$ _____

For pH 6, $[H^+] =$ _____

7) The two methods of determining pH values (pH indicator versus pH meter) should show similar pH values for those solutions. What was different?

8) Explain why rain is naturally acidic, but not all rain is classified as “acid rain.”

9) Here are examples of what an individual might do to reduce acid rain. For each, explain the connection to production of acid rain.

a. avoid running a washing machine with a small load

b. add additional insulation on a home hot water heater

c. walking instead of driving to work