

Name: _____
Period: ____

Lab: Acids and Bases

Purpose: To classify unknown substances as acidic, basic, or neutral.

Procedure:

I: Testing Known Solutions

- (1) Obtain a clean, dry twelve-well plate and dropper bottles containing the following acid-base indicators: phenolphthalein, bromothymol blue, and cabbage juice.
- (2) Obtain a strip of pH paper and cut it into eight pieces.
- (3) Obtain dropper bottles of hydrochloric acid and sodium hydroxide solutions as well a small beaker of water and an eyedropper.
- (4) Add four drops of hydrochloric acid solution to each well in the top row of the well plate, add four drops of sodium hydroxide solution to each well in the middle row of the well plate, and add two drops of water to each well in the bottom row of the well plate.
- (5) Add two drops of phenolphthalein to each well in the first column of the well plate. Observe any colour changes and record your observations in the table below.
- (6) Add two drops of bromothymol blue to each well in the second column of the well plate. Observe any colour changes and record your observations in the table below.
- (7) Add two drops of cabbage juice to each well in the third column of the well plate. Observe any colour changes and record your observations in the table below.
- (8) Put one piece of pH paper in each well in the fourth column of the well plate. Observe any colour changes and record your observations in the table below.

II: Testing Unknown Solutions

- (1) Obtain a clean, dry large well plate and dropper bottles containing unknown solutions A, B, C, D, and E.
- (2) Add four drops of solution A to each well in the first row of the well plate, add four drops of solution B to each well in the second row of the well plate, add four drops of solution C to each well in the third row of the well plate, add four drops of solution D to each well in the fourth row of the well plate, and add four drops of solution E to each well in the fifth row of the well plate.
- (3) Add two drops of phenolphthalein to each well in the first column of the well plate. Observe any colour changes and record your observations in the table below.
- (4) Add two drops of bromothymol blue to each well in the second column of the well plate. Observe any colour changes and record your observations in the table below.
- (5) Add two drops of cabbage juice to each well in the third column of the well plate. Observe any colour changes and record your observations in the table below.
- (6) Put one piece of pH paper in each well in the fourth column of the well plate. Observe any colour changes and record your observations in the table below.
- (7) Discard the contents of the well plates in the appropriate waste container and clean the well plates.

Observations:

I: Testing Known Solutions

Substance	Classification	Phenolphthalein	Bromothymol Blue	Cabbage Juice	pH paper
Hydrochloric Acid	acid				
Sodium Hydroxide	base				
Water	neutral				

II: Testing Unknown Solutions

Unknown Substance	Classification	Phenolphthalein	Bromothymol Blue	Cabbage Juice	pH paper
A					
B					
C					
D					
E					

Questions:

- (1) Write the chemical formula for hydrochloric acid and for sodium hydroxide.
- (2) Classify each unknown substance as acidic, basic, or neutral in the above table. Explain your classifications.

Conclusion:

List two common (household) substances that are acidic and two that are basic.