

Name _____

Investigating Acids and Bases

Lesson 7

PreLab:

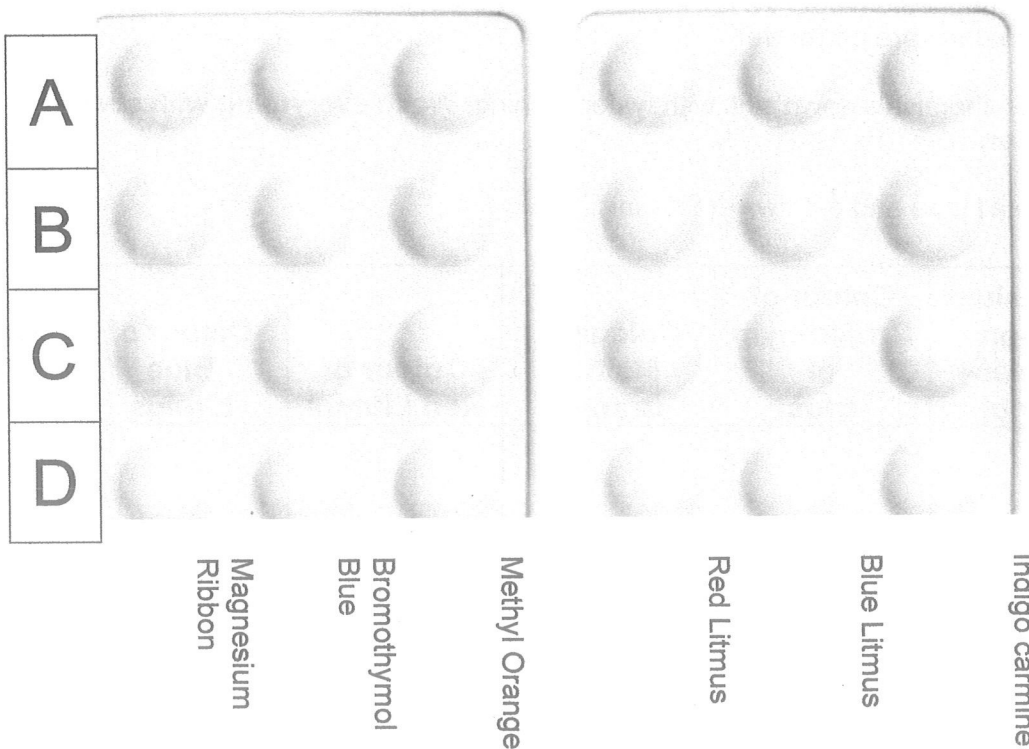
Read the procedure below.

Materials:

- 4 unknowns in small beakers labeled A, B, C, D
- Pipette
- 2 spot plates
- Tape to label spot plates
- Magnesium ribbon
- Litmus paper blue, red and ~~universal pH~~ *indigo carmine* (1 piece of each)
- 2 indicators: Bromothymol blue and methyl orange

Procedure:

1. The set up for the spot plate. (will depend on the number of wells you have)



2. Place a few drops of solution A into each of the six wells in row A. Wash pipette. Place a few drops of solution B into each of the six wells in row B. Wash pipette. Repeat for C and D. Be sure to wash pipette between each solution!

3. Add a piece of Magnesium ribbon to each well in column 1. Acids will react with magnesium producing bubbles, bases and neutral solutions will not. Record your results on the table below.
4. Add two drops of bromothymol blue indicator to each well in column 2. Record the result in the table below. Use your data pages to help you identify the range of the pH for this indicator.
5. Add a drop of methyl orange indicator to each well in column 3. Record the result in the table below. Use your data pages to help you identify the range of the pH for this indicator.
6. Add a piece of red litmus paper to each well in column 4. In the presence of a base, the red litmus will turn blue. Record your results in the table below.
7. Add a piece of blue litmus paper to each well in column 5. In the presence of an acid, the blue litmus will turn red. Record your results in the table below.
8. Add a drop of indigo carmine to each well in column 6. Use the chart to help you identify the pH.
9. Determine based on your experimental data whether the unknown liquids were acidic, basic or neutral. (first 4 analysis questions)
10. Remove magnesium strip WITH TWEEZERS and put in garbage. Be CAREFUL some solutions are corrosive!
11. Put other chemicals down sink with water running. **Wash everything with soap and water.**
12. Remove all tape and put away materials.

Unknown	Magnesium Ribbon (bubbles-yes/no)	Colour of Bromothymol Blue	Colour of Methyl Orange	Colour of Red Litmus	Colour of Blue Litmus	Colour of Indigo Carmine
A						
B						
C						
D						

Analysis:

Acid or Base?

1. According to our observations, the **unknown A** is most likely _____. Explain how your group came to this conclusion.

2. According to our observations, the **unknown B** is most likely _____. Explain how your group came to this conclusion.

3. According to our observations, the **unknown C** is most likely _____. Explain how your group came to this conclusion.

4. According to our observations, the **unknown D** is most likely _____. Explain how your group came to this conclusion.

5. List the solutions in order of most acidic to least acidic (most basic).

Discussion Questions:

1. How can magnesium metal or other metals help you to distinguish between an acid and a base?
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2. Which colour would each of the indicators be in a solution that is pH 3?

Methyl Orange:

Phenolphthalein:

Methyl Red:

Indigo Carmine:

Bromothymol Blue:

3. Which colour would each of the indicators be in a solution that is pH 10?

Methyl Orange:

Phenolphthalein:

Methyl Red:

Indigo Carmine:

Bromothymol Blue:

4. Suppose you were asked to put together a test kit to determine whether water taken from a factory waste drain was acidic, neutral, or basic. Your kit can only contain three tests. Which pH indicators would you choose, and why? (No pH or litmus paper)

a) _____

b) _____

c) _____

5. What is the colour of seawater that has Bromothymol Blue added to it? (Hint: Seawater has a pH of 8.1, approximately.) _____

6. How can you recognize an acid by its chemical formula?

7. How can you recognize a base by its chemical formula?
