**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Indicators Activity**

Part A: The Effect of Acids and Bases on Litmus Paper

1. Place 1 drop of 6M HCl in a well plate cavity. Test with red litmus paper. Observe and record the color. Then test with blue litmus and record the color.
2. Place 1 drop of .5 M NaOH in a well plate cavity. Test with red litmus paper. Observe and record the color. Then test with blue litmus and record the color.
3. Place 1 drop of water in a well plate cavity. Test with blue litmus paper. Observe and record the color in the observation table.

|   | Appearance of Litmus before | Appearance of litmus after |
| --- | --- | --- |
| HCl with red litmus | R |   |
| HCl with blue litmus | B |   |
| NaOH with red litmus | R |   |
| NaOH with blue litmus | B |   |
| H2O with red litmus  | R |  |
| H2O with blue litmus | B |  |

1. **Do your results from Part A agree with the pH ranges listed on table M? Explain.**

Part B: Determining pH Range of Indicators

1. Test all pH solutions with methyl orange and record the color you observe. Rinse the spot plate.
2. Test all pH solutions with bromothymol blue and record the color you observe. Rinse the spot plate.
3. Test all pH solutions with phenolphthalein and record the color you observe. Rinse the spot plate.

| pH | 1 | 3 | 5 | 7 | 9 | 11 | 13 |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Methyl orange |  |   |   |   |   |   |   |
| Bromothymol Blue |  |   |   |   |   |   |   |
| Phenolphthalein |  |   |   |   |   |   |   |

1. **Do your results from Part B agree with the pH ranges listed on table M? Explain.**
2. Complete the table below by shading each color of each indicator in the specific pH regions:

 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

| pH |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Methyl Orange |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Bromothymol Blue |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Phenolphthalein |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Litmus |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| BromcresolGreen |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Thymol Blue |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Part C: Determining the identity of an unknown solution.

1. Use the indicators to test the unknown solution. Record your observations below.
2. Use table M of your reference tables to determine each pH range that color represents.

| Indicator | Color | pH range |
| --- | --- | --- |
| Litmus |  |  |
| Phenolphthalein |  |  |
| Methyl Orange |  |  |
| Bromothymol Blue |  |  |

1. Provide a possible pH for your unknown.
2. Using Table M, predict what color this unknown solution would turn if bromocresol green was added.
3. Using Table M, predict what color this unknown solution would turn if thymol blue was added.

