**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ AP Chemistry Hydrolysis of Salts**

Guiding Question: How are non neutral salts formed and how do they influence pH?

PreLab:

1. Label each species as a weak or strong, acid or base.
   1. NaOH \_\_\_\_\_\_\_\_\_\_ c. NH3 \_\_\_\_\_\_\_\_\_\_ e. LiOH \_\_\_\_\_\_\_\_\_\_ g. Al(OH)3 \_\_\_\_\_\_\_\_\_\_
   2. HNO3 \_\_\_\_\_\_\_\_\_\_ d. HCl \_\_\_\_\_\_\_\_\_\_ f. H2CO3\_\_\_\_\_\_\_\_\_\_ h. HC2H3O2 \_\_\_\_\_\_\_\_\_
2. Identify which ions are present when the following salts dissolve in water. Then, label which acid or base they originated from.

| Salt | Cation | Acid or Base Cation is from | Anion | Acid of Base anion is from |
| --- | --- | --- | --- | --- |
| NaNO3 |  |  |  |  |
| LiCl |  |  |  |  |
| NH4Cl |  |  |  |  |
| Na2CO3 |  |  |  |  |
| AlCl3 |  |  |  |  |
| NaC2H3O2 |  |  |  |  |

1. Complete the hydrolysis equation for the following weak ions:
   1. NH4+ + HOH → \_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. C2H3O2-+ HOH → \_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. Al+3  + HOH → \_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. CO3-2 + HOH → \_\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Part One: Test each of the solutions with pH paper and record the relative pH.

1. Salt: NaNO3 Molarity: 1M pH: \_\_\_\_\_\_\_\_\_
2. Salt: LiCl Molarity: 1M pH: \_\_\_\_\_\_\_\_\_

What properties do all these salts have in common? (Hint: what type of acids and bases did they originate from?)

Part Two: Test each of the solutions with pH paper and record the relative pH.

1. Salt: NH4Cl Molarity: 1M Kb: 1.8x10-5 pH: \_\_\_\_\_\_\_\_\_
2. Salt: Na2CO3 Molarity: 1M Ka: 4.76x10-11 pH: \_\_\_\_\_\_\_\_\_

Based on the Molarity and Ka, verify the pH of the salt using ice box for salt three:

Based on the Molarity and Ka, verify the pH of the salt using ice box for salt four:

Part Three: Test each of the solutions with pH paper and record the relative pH.

1. Salt: AlCl3 Molarity: 1M pH: \_\_\_\_\_\_\_\_\_ K\_: \_\_\_\_\_\_\_\_\_\_
2. Salt: NaC2H3O2 Molarity: 1M pH: \_\_\_\_\_\_\_\_\_ K\_: \_\_\_\_\_\_\_\_\_\_

Based on the Molarity and pH, calculate the K of the salt using ice box for salt five:

Based on the Molarity and pH, calculate the K of the salt using ice box for salt six:

Questions:

1. What is the relationship between the type of salt formed and the strength of the acids and bases that formed them?
2. Underarm antiperspirants use salts containing aluminum ions. Explain how the aluminum ions work to help keep your underarms dry and what negative side effect results when it does work.