**Chem 12: Lab 4C - Hydrolysis** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*(formerly Lab 13D)*

**Questions:** Why don’t all salts dissolve to form solutions of pH 7?  
 How could we predict the pH range of a salt?

**Materials:**

* Samples of salt pastes (in petri dishes)
* Glass rods (1 per paste)
* pH paper (1 roll per group)
* Small dish (1 per group)
* Distilled water

**Procedure:**

* The dishes containing the salt pastes will be set up at stations around the room.
* Take your dish to a station. Note the formula of the salt at this station.
* Take a small piece of indicator paper and put it on your glass dish.
* Use the glass rod AT THE STATION to put a dab of the salt paste onto the indicator paper. Observe the colour (do this quickly, as it may change over time).
* Repeat until all salts, and a sample of distilled water, have been tested.
* DO NOT MIX UP THE GLASS RODS. This will contaminate the samples

**Data:**

Fill out the “Indicator colour” and “approx. pH” columns on the data chart during the experiment. Leave the remaining columns until it’s time to analyze your data.

**Analysis:**

Do not worry about sample calculations. Do your work ***on the data sheet***, unless otherwise noted.

Use your observations to estimate the pH of each salt, and identify as ACIDIC, BASIC, OR NEUTRAL. (Make these decisions by comparing to the distilled water, which we will call neutral even if it’s not exactly pH 7)

Identify all the ions present in the salt, then decide which ions will undergo hydrolysis.   
Fill in the chart. Write an equation for the reaction of each hydrolyzing ion with water.

Look up the Ka for acids. Calculate the Kb for bases.   
If an acid and a base both exist, compare them to see which is stronger.

Does the reaction you wrote agree with your pH range observation? (last column)

**CONCLUSION:** ***Please complete the conclusion on this page. Staple your data chart to this handout, and hand them in.***

*Look for patterns.* Answer each question below using

Claim (answer the question)  
Evidence (give examples from your data)  
Reasoning (explain the chemistry principles behind your claim)

1. How can you predict which salts will undergo hydrolysis and which ones will not?

2. How can you predict whether a salt with ONE hydrolyzing ion will form an acidic solution or  
 a basic one?

3. If you have a salt where BOTH ions undergo hydrolysis, how can you predict the pH range?   
 (What logic do you use, and how do you make a conclusion?)

4. If you have a salt with an amphiprotic ion, how can you tell if it will act as an acid or as a base?   
 (What logic do you use, and how do you make a conclusion?)

*Sources of Error:*

In your experiment, did ALL of your data agree with theory?  
If you observed salts that did not fully agree with theory, can you explain why you saw the results you did?   
Can you suggest improvements to your procedure that would give better data?