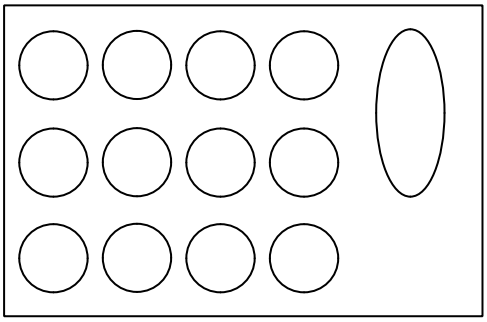
Name _____ Period ___ Date ___/___/___

13 • Acid-Base Reactions

HYDROLYSIS LAB



Introduction:

Some salts change the pH of a solution by interacting with H_2O. This is called hydrolysis and is the reason that the equivalence point of titrations is not always pH = 7.

Equipment:

12-well plate	distilled water
universal indicator	toothpicks
six salts	test tube rack

Write the formula for each of the six salts.

sodium sulfate	sodium acetate	potassium chloride	magnesium sulfate	ammonium chloride	sodium sulfite

Review what you know about the pH at the equivalence point of titrations:

Acid	Base	Resulting Solution is Acidic (pH<7)? Basic (pH>7)? Neutral (pH=7)?
Strong	Strong	
Weak	Strong	
Strong	Weak	
Weak	Weak	

Each of the salts can be considered the product of an acid + a base. Write the formula of the acid and base that produces each salt. Predict whether each salt will result in a solution that is acidic or basic.

Salt	Acid Formula	Strong/Weak?	Base Formula	Strong/Weak?	Resulting Sol'n
sodium sulfate					
sodium acetate					
potassium chloride					
magnesium sulfate					
ammonium chloride					
sodium sulfite					

Test Your Predictions:

- In seven of the wells place 10 drops of distilled water and 2 drops of universal indicator. Gently swirl the plate to mix. Each of the seven wells should have the same green (pH = 7) color.
- Carefully add several granules of one of the salts to each six of the wells. If necessary, use the toothpicks to stir. Keep track of which salt is in which well. What is the 7th cell for? _____
- Record the color of each solution:

sodium sulfate	sodium acetate	potassium chloride	magnesium sulfate	ammonium chloride	sodium sulfite

Explaining Your Results:
You can ***predict*** the pH of the salt solution using the strength of the acid & base that formed the salt. ***Explaining*** the pH of the solution, however, actually involves the strength of the conjugate acid and conjugate base.

The **conjugate acid of a strong base** is very weak and does not affect the pH of the resulting solution.
The **conjugate base of a strong acid** is very weak and does not affect the pH of the resulting solution.

Indicate the conjugate acids of **weak** bases or conjugate bases of **weak** acids in this chart.

*Note: most of the chart will be **blank**.*

Salt	conj. base of weak acid	conj. acid of weak base	Solution pH
sodium sulfate			
sodium acetate			
potassium chloride			
magnesium sulfate			
ammonium chloride			
sodium sulfite			

For each solution that changed color (pH), write a net equation that shows the hydrolysis involved.

Salt	Solution pH	Hydrolysis equation (if applicable)
sodium sulfate		
sodium acetate		
potassium chloride		
magnesium sulfate		
ammonium chloride		
sodium sulfite		