Name: _____ Date: _____



Class<u>:</u> **Chemistry** ~ Ms. Hart Anions or Cations

9.2 Classwork – pH



Fill in the blanks in the table below.

	Acid, Base, or	Possible		
	Neutral?	рН		
a.		4		
b.	Neutral			
c.		8		
d.	Base			

Remember:

6. For

The more H^+ ions there are (higher the concentration of H^+),

the more ______ it will be \rightarrow the ______ the pH value

The more OH⁻ ions there are (higher the concentration of OH⁻),

the more ______ it will be \rightarrow the ______ the pH value

For each of the questions below, circle the option that will have the *higher pH*.

a. Solution with H ⁺ concentrations of	0.43M	or	0.57M	
b. Solution with OH ⁻ concentrations of	2.4M	or	1.9M	
c. Solution with H ⁺ concentrations of	1.2M	or	3.2M	
d. Solution with OH ⁻ concentrations of	4.3M	or	4.4M	
each of the questions below, circle the optic	on that will	have	the <i>lower p</i>	H.

a. Solution with H ⁺ concentrations of	0.19M	or	0.23M
b. Solution with OH ⁻ concentrations of	5.6M	or	5.25M
c. Solution with H ⁺ concentrations of	9.9M	or	8.6M
d. Solution with H ⁺ concentration of	1.2M	or	3.2M

*Each change of a single pH unit signifies a tenfold change in the concentration of the hydrogen ion or the hydroxide ion.

The [H⁺] (concentration of H⁺ ions) is ten times greater in a solution with a pH of 5 as in a solution ٠ with a pH of 6.

• The [OH-] (concentration of OH- ions) is ten times greater in a solution with a pH of 11 as in a solution with a pH of 10.

Practice: (State which solution at the given pH value has the greatest amount of hydrogen or hydroxide ions and by how much) **1. pH of 1 versus pH of 2**

2. pH of 8 versus pH of 9

3. pH of 10 versus pH of 12

4. pH of 3 versus pH of 6

Classwork

- 1. Which substance is an Arrhenius base? Explain why in the lines provided below.
 - (1) CH_3OH
 - (2) CH₃Cl(3) LiOH
 - (3) LIOP (4) LiCl
 - (4) LICI
- 2. The compound NaOH (s) dissolves in water to yield
 - (1) hydroxide ions as the only negative ions
 - (2) hydroxide ions as the only positive ions
 - (3) hydronium ions as the only negative ions
 - (4) hydronium ions as the only positive ions
- 3. An Arrhenius acid has
 - (1) only hydroxide ions in solution
 - (2) only hydrogen ions in solution
 - (3) hydrogen ions as the only positive ions in solution
 - (4) hydrogen ions as the only negative ions in solution
- 4. Which Lewis electron-dot diagram correctly represents a hydroxide ion?



- 5. Which ion is the only negative ion produced by an Arrhenius base in water?
 (1) NO₃⁻
 - (2) Cl⁻
 - (3) OH-
 - (4) H-
- 6. Which statement describes an alternate theory of acids and bases?
 - (1) Acids and bases are both $\rm H^{\scriptscriptstyle +}$ acceptors
 - (2) Acids and bases are both H⁺ donors.
 - (3) Acids are H⁺ acceptors, and bases are H⁺ donors.
 - (4) Acids are H⁺ donors, and bases are H⁺ acceptors.
- 7. The only positive ion found in H_2SO_4 (aq) is the
 - (1) ammonium ion
 - (2) hydronium ion
 - (3) hydroxide ion
 - (4) sulfate ion
- 8. Which two formulas represent Arrhenius acids?
 - (1) CH₃COOH and CH₃CH₂OH
 - (2) $HC_2H_3O_2$ and H_3PO_4
 - (3) KHCO₃ and KHSO₄
 - (4) NaSCN and Na₂S₂O₃
- 9. Which compound releases hydroxide ions in an aqueous solution?(1) CH₃COOH
 - (1) CH₃COC (2) HCl
 - (2) HCI(3) CH₃OH
 - $(3) CII_{3}OII$
 - (4) KOH