

Unit 13 Acid/Base Review

Warning! This is JUST A REVIEW. The test can contain EVERYTHING we've learned in this unit. Your LECTURE NOTES will be the best study guide!

*Know how to name & give the formulas for BINARY ACIDS, POLYATOMIC ACIDS, and BASES.

*DON'T WORRY about strong acids/bases or weak acids/bases. It WILL NOT be on this test!

*Know all your PROPERTIES for acids and bases.

*Review what a hydronium ion is and how it is made.

Hydronium ion = H_3O^+ made by a proton (H^+) attaching to water (H_2O)

1. How do you recognize an acid? How do you recognize a base? Simple basic definition.

Acids $\rightarrow H^+$ ions

Bases $\rightarrow OH^-$ ions

2. Name the following acids and bases:

a. H_3P - hydrophosphoric acid

b. H_3PO_4 - phosphoric acid

c. H_3PO_3 - phosphorous acid

d. HCl - hydrochloric acid

e. HNO_3 nitric acid

f. $LiOH$ lithium hydroxide

g. $Mg(OH)_2$ magnesium hydroxide

h. $Cu(OH)_2$ copper (II) hydroxide

transition metal \rightarrow

3. Give the formulas for the following acids and bases:

a. Hydrosulfuric acid $H^+ S^{2-} = H_2S$

b. Sulfuric acid $H^+ SO_4^{2-} = H_2SO_4$

c. Nitrous acid $H^+ NO_2^- = HNO_2$

d. manganese (II) hydroxide $Mn^{2+} OH^- = Mn(OH)_2$

e. calcium hydroxide $Ca^{2+} OH^- = Ca(OH)_2$

f. potassium hydroxide $K^+ OH^- = KOH$

4. How do you recognize a mono-, di-, and tri-protic acid?

$1 H^+ \rightarrow 2 H^+ \rightarrow 3 H^+$

5. List properties of acids:

sour, turns litmus paper red, conducts electricity

6. List properties of bases:

bitter, slippery, turn litmus paper blue, conducts electricity

7. Which of the following is NOT an electrolyte? Why?

a. HCl

b. $NaBr$

c. $CoBr_2$

d. $Al(OH)_3$

e. NO_3

*Know ALL THREE THEORIES of acids and bases:

ARRHENIUS, BRONSTED-LOWRY, and LEWIS

*Know the difference and definition for the 3 theories of acids and bases! Very important!

*Review the definition of amphoteric and what an example might look like.

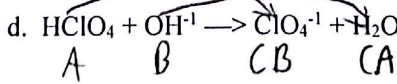
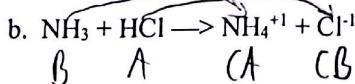
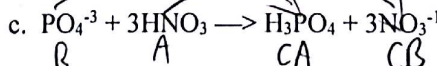
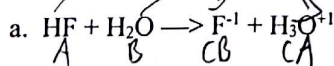
covalent = non-electrolytes

8. Arrhenius theory states that acids contains H^+ and bases contains OH^- .

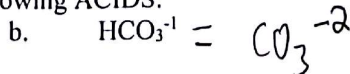
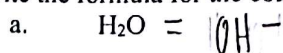
9. Bronsted-Lowry states that acids donates protons (H^+) and bases accepts protons (H^+).

10. Lewis theory states that acids accepts electrons and bases donates electrons.

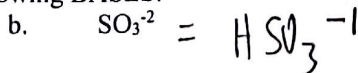
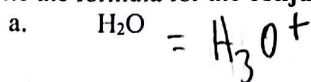
11. Identify each of the following reactants as an acid (A), base (B), conjugate acid (CA), or conjugate base (CB).



12. Write the formula for the conjugate base of the following ACIDS:



13. Write the formula for the conjugate acid of the following BASES:

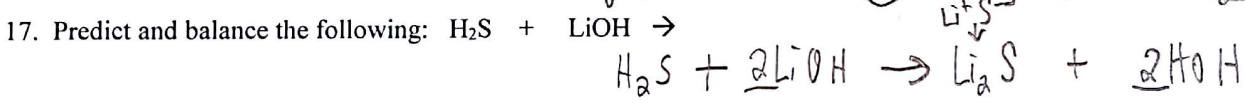
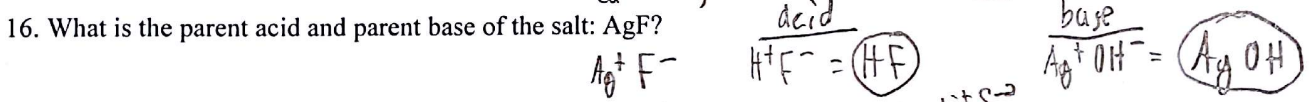
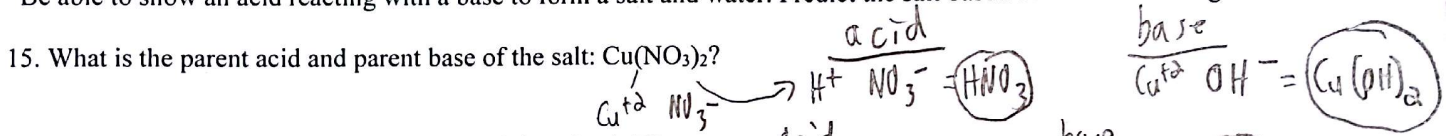


- *Know your pH scale. Be able to determine if the substance is acidic, basic, or neutral.
- *Know how to convert between all the given concentration/ pH/ pOH.
- *All the formulas will be given on the test!
- *For the TEST, one given is provided and you are task with finding whatever they are asking for. Critical thinking!

14. Fill in the following table:

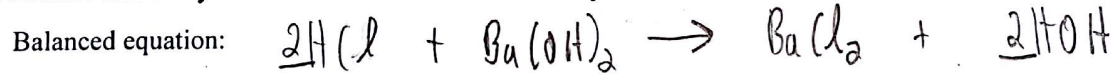
pH	[H ⁺]	pOH	[OH ⁻]	Acid or Base
5.0	$1.0 \times 10^{-5} M$	9	$1.0 \times 10^{-9} M$	A
2.08	8.4×10^{-3}	11.92	$1.2 \times 10^{-12} M$	A
9.5	$3.2 \times 10^{-10} M$	4.50	$3.2 \times 10^{-5} M$	B

- *Know what a neutralization reaction is (also known as double replacement reaction). What are the reactants and what are the products in a neutralization reaction.
- *Be able to recognize a neutralization reaction.
- *Be able to go from a SALT back to the parent acid and parent base.
- *Be able to show an acid reacting with a base to form a salt and water. Predict the salt based on acid and base given.



- *You are NOT ABLE to do the bottom section until we learn lecture 13.5 which will be on Monday (5/1/2017).
- *Understand the purpose of titration and when to use it.

18. What is the **molarity** of a solution of barium hydroxide if 15.0 mL are completely neutralized by 20.0 mL of 0.900 M hydrochloric acid? In your answer include the balanced equation!

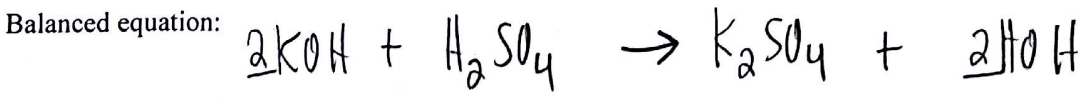


Calculation: $(H^+) M_A V_A = (OH^-) M_B V_B$

$(1)(0.900)(20.0) = (2) M_B (15.0) \rightarrow \text{solve for } M_B?$

$\rightarrow \boxed{M_B = 0.60 M}$

19. How many mL of 0.200 M potassium hydroxide will neutralize 20.0 mL of 0.500 M sulfuric acid?



Calculation: $(H^+) M_A V_A = (OH^-) M_B V_B$

$(2)(0.500)(20.0) = (1)(0.200) V_B$

$\rightarrow \boxed{V_B = 100 mL}$

↳ solve for V_B ?