

Chemistry – Ch.19 Quiz

Name:

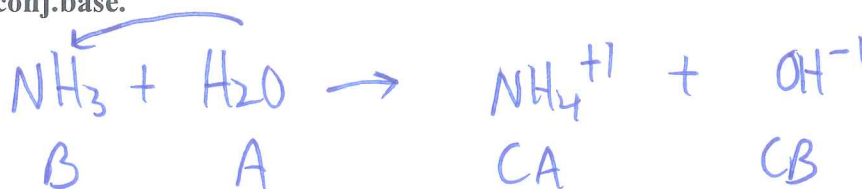
CALVIN

Date:

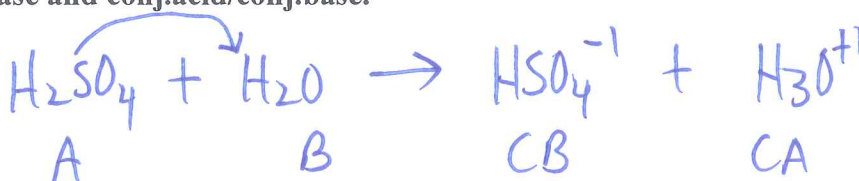
Hour:

40

- 1) Write a rxn between Ammonia (NH<sub>3</sub>) and water. Identify the acid/base and conj.acid/conj.base.



- 2) Write a reaction between Sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) and water. Identify the acid/base and conj.acid/conj.base.



- 3) **TO THE LEFT** of each letter: Classify each as an acid (A) or base (B)

A a. HCl mono

B b. Na(OH)

A c. H<sub>2</sub>(SO<sub>4</sub>) di

A/B d. H<sub>2</sub>O mono/di

B e. Mg(OH)<sub>2</sub>

A f. CH<sub>3</sub>COOH mono

A g. H(NO<sub>3</sub>) mono

A h. H<sub>3</sub>(PO<sub>4</sub>) tri

B i. Li(OH)

- 4) Go back to #3 and **TO THE RIGHT** of each acid, label it as (monoprotic, diprotic, triprotic)

- 5) Write out a neutralization reaction between Sodium Hydroxide and Hydrochloric acid.



6) Label each with "Concentrated/dilute" and "weak/strong" and "acid/base"

- a. 12 M  $\text{H}_2(\text{SO}_4)$  conc., strong, acid
- b. 0.1 M  $\text{HCl}$  dilute, strong, acid
- c. 0.5 M  $\text{Na}(\text{OH})$  dilute, strong, base
- d. 14 M  $\text{H}(\text{NO}_3)$  conc., strong, acid
- e.  $1 \times 10^{-3}$  M  $\text{Ba}(\text{OH})_2$  dilute, strong, base
- f. 2 M Ammonia dilute, weak, base
- g. 1.2 M acetic acid dilute, weak, acid

COMMON ACIDS AND BASES			
Strong Acids		Strong Bases	
$\text{HCl}$	hydrochloric acid	$\text{NaOH}$	sodium hydroxide
$\text{HNO}_3$	nitric acid	$\text{KOH}$	potassium hydroxide
$\text{H}_2\text{SO}_4$	sulfuric acid	$\text{Ba}(\text{OH})_2$	barium hydroxide
Weak Acids		Weak Bases	
$\text{CH}_3\text{COOH}$	acetic acid	$\text{NH}_3$	ammonia
$\text{H}_2\text{CO}_3$	carbonic acid	$\text{CH}_3\text{NH}_2$	methyl amine
$\text{H}_3\text{PO}_4$	phosphoric acid		

### BONUS

Correctly spell a word you know that has 4 or more syllables (must be a word that can be found in dictionary). Extra points *possible* for extra syllables.

*Reasonable*

40

- D 1) A water solution is neutral if \_\_\_\_ .  
 a) it contains no Hydronium ions  
 b) it contains no ionized water molecules  
 c) it contains no Hydronium or Hydroxide ions  
 d) the concentrations of Hydronium and Hydroxide ions are equal
- C 2) Which of the following is the pH range indicator that is useful in studying a *neutralization* reaction?  
 a) 1.2 to 3.0    b) 3.1 to 4.6    c) 6.0 to 7.6    d) 9.5 to 11.0
- B 3) Acids have a taste that is:  
 a) sweet    b) sour    c) bitter    d) salty
- C 4) Bases have a taste that is:  
 a) sweet    b) sour    c) bitter    d) salty
- C 5) Bases feel:  
 a) rough    b) moist    c) slippery    d) dry
- A 6) What acid is found in vinegar?  
 a) acetic acid    b) nitric acid    c) phosphoric acid    d) hydrochloric acid
- C 7) Which acid is found in fertilizer?  
 a) acetic acid    b) sulfuric acid    c) nitric acid    d) hydrochloric acid
- D 8) Which acid reacted with Zinc in class to produce Hydrogen gas?  
 a) acetic acid    b) sulfuric acid    c) nitric acid    d) hydrochloric acid
- D 9) Which is a binary acid?  
 a) acetic acid    b) sulfuric acid    c) nitric acid    d) hydrochloric acid
- C 10) 12M HNO<sub>3</sub> acid is:  
 a) concentrated, weak    b) dilute, weak    c) concentrated, strong    d) dilute, strong
- B 11) Protons are important to the definition of acid/base for:  
 a) Arrhenius    b) Bronsted-Lowry    c) Lewis
- C 12) Electron pairs are important to the definition of acid/base for:  
 a) Arrhenius    b) Bronsted-Lowry    c) Lewis
- A 13) Arrhenius acids increase the concentration of:  
 a) Hydronium [H<sub>3</sub>O<sup>+1</sup>]    b) Hydroxide [OH<sup>-1</sup>]
- B 14) The conjugate base of HNO<sub>3</sub> is:  
 a) H<sub>2</sub>(NO<sub>3</sub>)<sub>2</sub>    b) NO<sub>3</sub><sup>-1</sup>

True or False – Mark ‘T’ or ‘F’ → make the statement TRUE if false!

- T 15) *Amphoteric* means a substance (like water) can act as an acid or a base
- T 16) A strong acid and a strong base will react to form a salt and water.
- F 17) Acids make litmus paper turn blue. *Red*
- T 18) Ammonia is a base.
- T 19) pH goes with Hydronium (H<sub>3</sub>O<sup>+1</sup>) and pOH goes with Hydroxide (OH<sup>-1</sup>)

20) Write any THREE things from your note card here:

*Reasonable*

21) Give THREE examples of an acid/base indicator:

phenolphthalein, universal/rainbow indicator, pH paper, litmus paper,  
red cabbage juice, etc...

22) Aqueous solutions of bases have a bitter taste. Aqueous solutions of acids have a sour taste. \*\*However, taste should NEVER be used to evaluate a chemical substance.

23) Sodium Hydroxide, sometimes called 'lye' is used in some drain cleaners. Write a formula for this compound and indicate whether it is an acid or a base.

NaOH Base

24) Give the pH of:

a) Weak acid      b) Strong base      c) Strong acid      d) Weak base      e) Neutral  
(  $\approx 6.5$        $\approx 14$        $\approx 1$        $\approx 7.5$        $\approx 7$  )

25) Write TWO more things from your notecard not asked on the quiz:

Reasonable

Go VIKINGS!!

40

Nombre: CALVIN  
Hora:  
Fecha:

### Chemistry pH quiz

#### Circle best answer

- 1) Arrhenius acids increase the (Hydronium, Hydroxide) concentration.
- 2) Bronsted-Lowry (acids, bases) act as proton donors.
- 3) Bronsted-Lowry (acids, bases) act as proton acceptors.
- 4) Lewis acids (accept, donate) electron pairs.
- 5) Acids have a pH of (above 7, below 7).
- 6) Bases have a pH of (above 7, below 7)
- 7) A strong acid is (concentrated, dissociates completely).
- 8) A substance with a pOH of 2 will be (acidic, basic, neutral).
- 9) (phenolphthalein, universal indicator) was used in the titration lab.
- 10) (phenolphthalein, universal indicator) was used in class to make different colors in the beaker as we added "A" and "B" alternately.
- 11) The pH will be neutral when [Hydronium] is (greater than, less than, equal to) [Hydroxide]

#### Short Answer

- 12) amphoteric is the term that applies to water's ability to act as an acid or a base.
- 13) "pH" stands for: power of Hydronium
- 14) Complete chart:
 

	<u>Acid</u>	<u>Base</u>
Arrhenius	↑ [H <sub>3</sub> O <sup>+</sup> ]	↑ [OH <sup>-</sup> ]
Bronsted-Lowry	proton donor	proton acceptor
Lewis	electron pair acceptor	electron pair donor
- 15) Write down the quote of the day OR word of the day from yesterday.

Reasonable

16) Find the pH, pOH and Hydronium of  $3.72 \times 10^{-12} \text{M}$  [Hydroxide]

$$\text{pH} = 2.57$$

$$[\text{H}_3\text{O}^+] = 2.7 \times 10^{-3} \text{M}$$

$$\text{pOH} = 11.4$$

$$[\text{OH}^-] = 3.72 \times 10^{-12} \text{M}$$

17) Write four facts about:

Acids

Bases

Reasonable

Reasonable

18) Determine [Hydronium] if pOH is 9.12. Is this an acid or base?

$$[\text{H}_3\text{O}^+] = 1.32 \times 10^{-5} \text{M}$$

Acid

19) Determine the pOH, Hydroxide and pH if the [Hydronium] is  $3.4 \times 10^{-3} \text{M}$

$$\text{pH} = 2.47$$

$$[\text{H}_3\text{O}^+] = 3.4 \times 10^{-3} \text{M}$$

$$\text{pOH} = 11.5$$

$$[\text{OH}^-] = 2.94 \times 10^{-12} \text{M}$$

Bonus:

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Reasonable

Chemistry Ch.19 T/F/Bonus ~ Quiz

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- F 1) A 12 on the pH scale would be considered a strong acid.
- T 2) pH paper is an example of an acid/base indicator.
- T 3) Acids have a taste that is sour.
- T 4) Bases have a taste that is bitter.
- T 5) Bases feel slippery.
- F 6) Hydrochloric acid is found in vinegar.
- F 7) The pH scale goes from 1-14.
- T 8) In class we have used Hydrochloric acid and Zinc to produce Hydrogen gas.
- T 9) A pH of 7 is considered neutral.
- T 10) 12M Nitric acid is considered a strong acid.
- T 11) The Bronsted-Lowry definition of acids/bases emphasizes the role of protons.
- T 12) Electron pairs are important to the definition of acid/base according to Lewis.
- F 13) Arrhenius acids increase the concentration of Hydroxide ( $\text{OH}^{-1}$ ).
- T 14) Ammonia is a weak base.
- T 15) Bass guitars have the low tones.
- T 16) Amphoteric refers to items that can act as an acid or a base.
- T 17) A 2 on the pH scale would be considered a strong acid.
- F 18) A 6M solution of acid would become less concentrated if you let some water evaporate.
- T 19)  $\text{Na}(\text{OH})$  is found in drain cleaner. This is a strong base.
- F 20) Acetic acid is an example of a weak base.

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BONUS

/ 20

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Go Vikings!!