

Name _____

Date _____ Period _____

ACID AND BASE QUIZ

1. Write the correct chemical formula for each acid below. Label each acid as monoprotic, diprotic, or triprotic. Also, indicate how many ionizable hydrogens each acid contains.

a. phosphorous acid

b. carbonic acid

2. Why is water considered amphoteric?

3. a. Name 3 properties of an acid.

b. Name 3 properties of a base.

4. Find the pH for solutions with the following measurements. Also indicate whether the solution is acidic, basic, or neutral:

a. $\text{pOH} = 8$

b. $[\text{H}^+] = 2.45 \times 10^{-6}\text{M}$

c. $[\text{OH}^-] = 9.0 \times 10^{-13}\text{M}$

5. Find $[\text{H}^+]$ for the following:

a. $\text{pH} = 3.4$

b. $\text{pOH} = 6$

c. $[\text{OH}^-] = 4.5 \times 10^{-4}$

6. Write the balanced equation for the mixing of ^{hydrochloric} acid (a strong acid) added to calcium hydroxide (a strong base). What type of reaction is this?

Name _____

Partner's Name _____

7. Fill in the correct term for the following statements.
- a. _____ is the point at which the #H⁺ ions = #OH⁻.
 - b. _____ is the point at which the indicator changes color in a titration.
8. What is the conjugate base of each of the following acids?
- a. HClO₄
 - b. H₂S
 - c. PH₄⁺
9. What is the conjugate acid of each of the following bases?
- a. CN⁻
 - b. SO₄²⁻
 - c. H₂O
10. For each of the following reactions, label the acid, base, conjugate acid, and the conjugate base.
- a. HNO_{2(aq)} + H₂O(l) ⇌ NO₂⁻(aq) + H₃O⁺(aq)

 - b. NH_{3(aq)} + H₂O(l) ⇌ NH₄⁺(aq) + OH⁻(aq)
11. Some commercials tout the benefits of buffered aspirin. Aspirin is the generic term for the compound acetylsalicylic acid. What could be a benefit of buffered aspirin?
12. What is the molarity of hydrochloric acid if 300.0ml of it is completely neutralized by 100.0ml of 2.50M sodium hydroxide solution?
13. How many milliliters of 1.50M hydrochloric acid will neutralize 100.0ml of 2.50M sodium hydroxide?

Name Sturman Key
 Date _____ Period _____

ACID AND BASE QUIZ

1. Write the correct chemical formula for each acid below. Label each acid as monoprotic, diprotic, or triprotic. Also, indicate how many ionizable hydrogens each acid contains.

+2 a. phosphorous acid
 H_3PO_3
 triprotic
 3 ionizable H's

+2 b. carbonic acid
 H_2CO_3
 diprotic
 2 ionizable H's.

+1 2. Why is water considered amphoteric?
 Water can act as an acid or a base.

+3 (1/2 each) 3. a. Name 3 properties of an acid.
 1) sour 2) donate H^+ 3) strong electrolyte
 4) water 5) sour 6) reacts w/ metal

+3 b. Name 3 properties of a base.
 1) bitter 2) donate OH^- (or accepts H^+)
 3) strong electrolyte 4) causes indicators to Δ color

+4 1/2 4. Find the pH for solutions with the following measurements. Also indicate whether the solution is acidic, basic, or neutral:

a. $pOH = 8$
 $pH = 6$
 slightly acid

b. $[H^+] = 2.45 \times 10^{-6} M$
 $pH = -\log(2.45 \times 10^{-6})$
 $= 5.61$
 acidic

c. $[OH^-] = 9.0 \times 10^{-13} M$
 $pOH = -\log(9.0 \times 10^{-13})$
 $= 12$
 $pH = 2$
 acidic

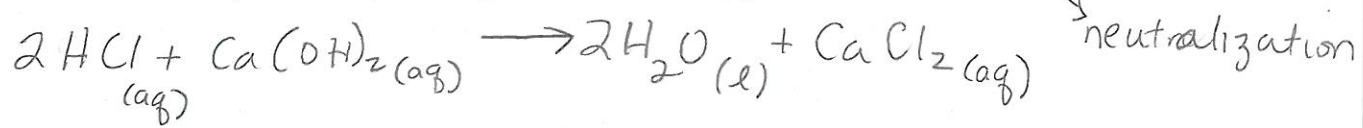
+3 5. Find $[H^+]$ for the following:

a. $pH = 3.4$
 $-\log[H^+] = 3.4$
 $\log[H^+] = -3.4$
 $[H^+] = 10^{-3.4} = 4.0 \times 10^{-4} M$

b. $pOH = 6$
 $pH = 8$
 $[H^+] = 1.0 \times 10^{-8} M$

c. $[OH^-] = 4.5 \times 10^{-4}$
 $pOH = -\log(4.5 \times 10^{-4})$
 $= 3.3$
 $pH = 14 - 3.3 = 10.7$
 $[H^+] = 10^{-10.7} = 2.0 \times 10^{-11} M$

+2 1/2 6. Write the balanced equation for the mixing of hydrochloric acid (a strong acid) added to calcium hydroxide (a strong base). What type of reaction is this?



7. Fill in the correct term for the following statements.

- a. Equivalence pt is the point at which the #H⁺ ions = #OH⁻.
 b. End pt is the point at which the indicator changes color in a titration.

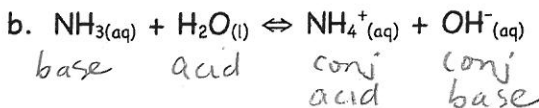
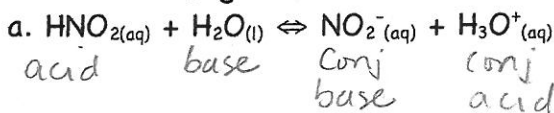
8. What is the conjugate base of each of the following acids?

- a. HClO₄ ClO₄⁻ b. H₂S HS⁻ c. PH₄⁺ PH₃

9. What is the conjugate acid of each of the following bases?

- a. CN⁻ HCN b. SO₄²⁻ HSO₄⁻ c. H₂O H₃O⁺

10. For each of the following reactions, label the acid, base, conjugate acid, and the conjugate base.



11. Some commercials tout the benefits of buffered aspirin. Aspirin is the generic term for the compound acetylsalicylic acid. What could be a benefit of buffered aspirin?

Buffered aspirin contain buffering compounds which resists changing pH of the stomach. This can reduce side effects of discomfort

12. What is the molarity of hydrochloric acid if 300.0ml of it is completely neutralized by 100.0ml of 2.50M sodium hydroxide solution?

dissolving the stomach's lining.

$$M_1 V_1 = M_2 V_2 \quad 2.50 (100.0) = M_2 (300.0)$$

$$M_2 = .833 \text{ M HCl}$$

same as
 $M_1 V_1 = M_2 V_2$ when equivalents are the same.

13. How many milliliters of 1.50M hydrochloric acid will neutralize 100.0ml of 2.50M sodium hydroxide?

$$M_1 V_1 = M_2 V_2$$

$$1.5 V_1 = 2.50 (100.0)$$

$$V_1 = 166.66 \rightarrow 167 \text{ mL}$$