

Unit 4 Review
Acids and Bases

Name: _____

Date: _____ Per: _____

Format:

25 selected response NO BCR

Things you will be given:

- a periodic table (it will NOT have the oxidation numbers listed)
- a common ion sheet
- all formulas and conversion factors

Objectives:

- name and write formulas for binary acids, oxyacids, and bases containing hydroxide
 - identify an acidic, basic, or neutral solution based on its properties
 - define an acid or a base using both the Arrhenius or Bronsted-Lowry definitions
 - identify a conjugate acid or conjugate base
 - describe a strong or weak acid or base
 - describe a concentrated or dilute acid or base
 - how to write an equilibrium expression
 - how to calculate the equilibrium constant when given reactant and product concentrations
 - how to calculate pH and pOH
 - how to calculate hydrogen and hydroxide ion concentration when given the pH or pOH
 - define and describe a neutralization reaction
 - calculate an unknown molarity using data from an acid-base titration and the dilution formula
 - define and describe a buffer
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1. Name the following acids or bases:

A. NaOH

B. HCl

C. HClO₃

D. H₂SO₄

E. H₃PO₃

2. Write formulas for the following acids or bases:

A. Hydroiodic acid

B. Phosphorous acid

C. Acetic acid

D. Calcium hydroxide

E. Potassium hydroxide

3. Describe to following solutions based on the kinds of ions found in the solution:

A. Acid

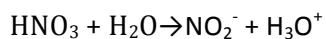
B. Basic

C. Neutral

4. Define and give an example of each of the following:

- A. An Arrhenius Acid
- B. An Arrhenius Base
- C. A Bronsted-Lowry Acid
- D. A Bronsted-Lowry Base
- E. An Amphoteric substance

5. Identify the acid, base, conjugate acid, and conjugate base in the following reaction:



6. Discuss the difference between the composition and properties of a strong acid and weak acid.

7. Discuss the difference between the composition and properties of a concentrated acid and a dilute acid.

8. Write an equilibrium constant expression for the following reaction equation: $2\text{SO}_3(\text{g}) \leftrightarrow 2\text{SO}_2(\text{g}) + \text{O}_2(\text{g})$

9. Calculate the value of the equilibrium constant for the reaction in number 8 if the following concentrations were present at equilibrium: $[\text{SO}_3]=0.0160 \text{ mol/L}$; $[\text{SO}_2]=0.00560 \text{ mol/L}$; and $[\text{O}_2]=0.00210 \text{ mol/L}$

10. Given the concentration of either hydrogen ion or hydroxide ion, use the ion product constant of water to calculate the concentration of the other ion. $K_w= 1.0 \times 10^{-14}$

A. $[\text{H}^+]= 1.0 \times 10^{-4}\text{M}$

B. $[\text{OH}^-]=1.3 \times 10^{-2}\text{M}$

11. Calculate the pH of solutions with the following ion concentrations.

A. $[\text{H}^+]= 1.0 \times 10^{-4}$

B. $[\text{OH}^-]=1.0 \times 10^{-12}$

12. Calculate the $[H^+]$ and $[OH^-]$ of each of the following solutions.

A. pH= 3.0

B. pH=5.24

13. Write a balanced equation for the neutralization reaction between KOH and HCl. In your reaction equation identify the acid, the base, and the salt, and list properties of each.

14. A solution of 0.600M HCL is used to titrate 15.00mL of KOH solution. The endpoint of the titration is reached after the addition of 27.13mL of HCL. What is the concentration of the KOH solution?

15. What is a buffer and how do buffers work?