

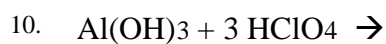
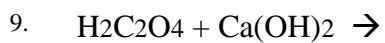
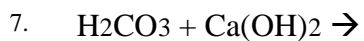
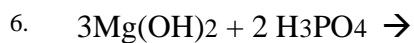
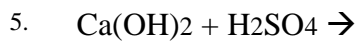
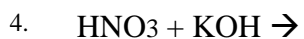
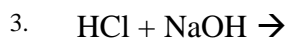
Student Name:**Grade:** 09**Test Name:** November Chemistry for All: Unit 10 - Acid/Base**Version:** 1

1. Which of the following inorganic acid formulas represents hydrochloric acid?
 - (a) H_2Cl
 - (b) HCl_2
 - (c) HClO_3
 - (d) HCl

2. What is the formula for magnesium hydroxide?
 - (a) $\text{Mg}(\text{OH}_2)$
 - (b) $\text{Mg}(\text{OH})_2$
 - (c) Mg_2OH
 - (d) MgOH_2

Instructions for questions 3 through 10.

Write the **balanced** equation for these neutralization reactions:



11. Listed below are some of the properties of acids and bases. Fill in the blanks with the appropriate word, **acids** or **bases**:

_____ produce hydrogen ions (H^+) in solution
_____ have a sour taste
_____ have a bitter taste
_____ have a slippery, soapy feel
_____ produce hydroxide ions (OH^-) ions
_____ react with acids to form salts
_____ react with bases to form salts
_____ react with many metals

12. What is the pH scale?

13. What exactly do the initials “pH” stand for?

14. Why is pure water considered neutral on the pH scale?

15. Classify each of the following as **acidic**, **neutral**, or **basic**. The pH of each item is also listed. Use the ans. bank below!

a) tomatoes: 4.2 _____
b) eggs: 7.8 _____
c) ammonia: 11.0 _____
d) tap water: 7.2 _____

e) soil: 5.5 _____
f) milk: 6.4 _____
g) bleach: 12.0 _____
h) lye (NaOH): 14 _____

16. Given the following values for $[\text{H}_3\text{O}^+]$ and $[\text{OH}^-]$ calculate the pH or pOH.

Indicate if the solutions are acidic or basic.

$$[\text{H}_3\text{O}^+] = 1.3 \times 10^{-4} \text{ mol/l}$$

$$[\text{OH}^-] = 3.5 \times 10^{-4} \text{ mol/l}$$

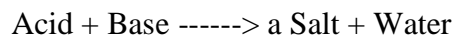
$$[\text{H}_3\text{O}^+] = 2.6 \times 10^{-8} \text{ mol/l}$$

$$[\text{OH}^-] = 7.4 \times 10^{-8} \text{ mol/l}$$

$$[\text{H}_3\text{O}^+] = 5.5 \times 10^{-2} \text{ mol/l}$$

Instructions for questions 17 through 21.

All reactions between strong acids and bases follow the same general form.

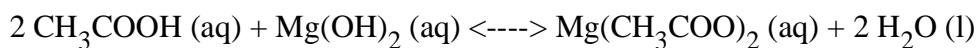


Write balanced equations for the neutralization reaction between the following. Identify the acid, base and salt

17. Sulfuric Acid and sodium hydroxide
18. Nitric Acid and calcium hydroxide
19. Hydrochloric acid and potassium hydroxide
20. Perchloric acid and barium hydroxide
21. Hydrochloric acid and magnesium hydroxide

Instructions for questions 22 through 23.

Calculate the concentration of acetic acid (CH_3COOH), if an average of 67.0 ml of 0.468 mol/l magnesium hydroxide ($\text{Mg}(\text{OH})_2$) is required to titrate 50.0 ml of the acid in order to reach the endpoint. The neutralization reaction is:



22. Balance the neutralization equation above. Determine the balance of base and acid.
23. Using the neutralization equation calculate the concentration of sulfuric acid.

Instructions for questions 24 through 25.

Calculate the concentration of KOH (aq) if 65.0 ml of the base are used to titrate a 15.0 ml sample of 1.50 M H_2SO_4 to the endpoint (equivalence point).

24. Write a balanced chemical equation for the reaction of KOH (aq) with H_2SO_4 (aq).
25. Using the neutralization equation calculate the concentration of KOH (aq).

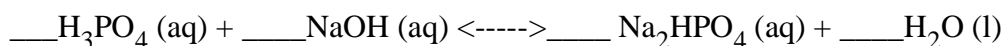
Instructions for questions 26 through 27.

An average volume of 24.5 ml of 0.560 mol/l $\text{Ca}(\text{OH})_2$ was required to titrate 10.0 ml samples of sulfuric acid (H_2SO_4) to their endpoints. What is the concentration of sulfuric acid?

26. Write a balanced neutralization equation for the reaction of $\text{Ca}(\text{OH})_2$ (aq) with H_2SO_4 (aq).
27. Using the neutralization equation calculate the concentration of sulfuric acid.

Instructions for questions 28 through 29.

What volume of 0.060 mol/l NaOH is needed to titrate 25.0 ml samples of 0.075 mol/l H_3PO_4 (aq) to the second endpoint. The neutralization reaction is as follows.



28. Balance the equation above and determine the balance of the base and acid.
29. Using the titration formula calculate the volume of base needed.
30. Explain the pH difference between acid rain and pure water:
31. Describe the major cause of acid rain:
32. Why is acid rain of particular interest?
33. What are the main chemicals in air pollution that create acid rain?
34. How long does the chemical reactions take that change air pollution to acid rain?
35. What did the U.S. government do at first to reduce the pollution from smokestacks?
36. How successful was this government action?

37. Which region of the Continental United States is the most affected by acid rain?