**Section 1 Acids**

*Goals*

* *To describe acids*
* *To make the distinction between strong and weak acids.*
* *To show the changes that take place on the particle level when acids dissolve in water.*
* *To show how you can recognize strong and weak acids.*

The most important skills to develop in this section are to be able to recognize acids from names or formulas.

**Identification of Acids and Bases:** Identify each of the following as an Arrhenius strong acid, an Arrhenius weak acid, an Arrhenius strong base, or an Arrhenius weak base.

1. HNO3 **strong acid**
2. lithium hydroxide **strong base**
3. K2CO3 **weak base**
4. hydrofluoric acid **weak acid**

**Section 2 Acid Nomenclature**

* *Goal: To describe how to convert between names and chemical formulas for acids.*

This section adds acids to the list of compounds for which you should be able to convert between names and formulas.

**Formulas for Acids:** Write the chemical formulas that correspond to the names

1. hydrofluoric acid: *This name has the form of a binary acid, hydro(root)ic acid, so its formula is* **HF(aq)**.
2. phosphoric acid: *This name has the form of an oxyacid, (root)ic acid, so it contains hydrogen, phosphorus, and oxygen. Phosphate is PO43**, so phosphoric acid is* **H3PO4**.

**Naming Acids:** Write the names that correspond to the chemical formulas

1. HI: *This is a binary acid, so its name has the form hydro(root)ic acid. HI(aq) is* **hydriodic acid**.
2. HC2H3O2: *The name of the oxyanion C2H3O2– is acetate, so HC2H3O2 is* **acetic acid**.

**Section 3 Summary of Chemical Nomenclature**

* *Goal: To review the process for converting between names and formulas for binary and ternary covalent, ionic compounds, acids, and oxyacids compounds.*

The ability to convert among names and formulas for chemical compounds is crucial to communication between chemists and chemistry students.





**Review:**

1. Identify each of the following characteristics as associated with acids or bases.
2. tastes sour
3. turns litmus red
4. reacts with HNO3
5. The pH of processed cheese is kept at about 5.7 to prevent it from spoiling. Is this acidic, basic, or neutral?
6. Which is more acidic, carbonated water with a pH of 3.95 or milk with a pH of 6.3?
7. **Formulas to Names:** Write the names that correspond to the following chemical formulas.
   1. AlF3
   2. PF3
   3. H3PO4
   4. CaCO3
   5. Ca(HSO4)2
   6. CuCl2
   7. NH4F
   8. HCl(*aq*)
   9. (NH4)3PO4
8. **Names to Formulas:** Write the chemical formulas that correspond to the following names.
   1. Ammonium Nitrate
   2. Acetic Acid
   3. Sodium Hydrogen Sulfate
   4. Potassium Bromide
   5. Magnesium Hydrogen Phosphate
   6. Hydrofluoric Acid
   7. Diphosphorus Tetroxide
   8. Aluminum Carbonate
   9. Sulfuric Acid
9. Any substance that has a **\_\_\_\_\_\_\_\_\_\_\_** taste is an acid.
10. An **\_\_\_\_\_\_\_\_\_\_\_** solution is a solution with a significant concentration of H3O+.
11. A **\_\_\_\_\_\_\_\_\_\_\_** acid is a substance that is incompletely ionized in water because of the reversibility of its reaction with water that forms hydronium ion.
12. Binary acids are named by writing **\_\_\_\_\_\_\_\_\_\_** followed by the root of the name, then **\_\_\_\_\_\_\_**, and **\_\_\_\_\_\_\_\_\_***.*
13. A base is a substance that produces **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** when it is added to water.
14. Compounds that contain hydroxide ions are often called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
15. A weak base is a base that produces **\_\_\_\_\_\_\_\_\_\_\_** hydroxide ions in water solution than there are particles of base dissolved.
16. Basic solutions have pH values **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, and the more basic the solution is, the **\_\_\_\_\_\_\_\_\_\_\_** its pH.
17. When an Arrhenius acid is combined with an Arrhenius base, we say that they **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**each other.
18. Classify each of the following solutions as acidic, basic, or neutral. *(Obj 19)*
19. tomato juice with a pH of 4.53
20. milk of magnesia with a pH of 10.4
21. urine with a pH of 6.8
22. An apple with a pH of 2.9
23. Milk of Magnesia with a pH of 10.4
24. Fresh egg white with a pH of 7.6
25. Of the following acids, \_\_\_\_\_\_\_\_\_\_ is not a strong acid.
    1. HNO2
    2. H2SO4
    3. HNO3
    4. HClO4
    5. HCl
26. Explain why weak acids produce fewer H3O+ ions in water than strong acids, even when the same number of acid molecules is added to equal volumes of water.
27. Describe the process of a neutralization reaction. What are the products for such reaction?
28. Explain the relationship of hydronium to pH values.
29. Explain how pH can be determined.