

## Acids and Bases

Circle the term that correctly completes each statement

1. Bases taste (bitter) sweet).
2. Litmus paper in a base is (pink, blue).
3. Bases react with acids to produce (salts, oxides).
4. Bases (do) do not) conduct an electric current.

Identify each property as applying to an acid, base, or both.

5. sour taste acid
6. electrolyte both
7. changes color of indicator both
8. slippery feel bases

Complete the Venn diagram to compare and contrast acids and bases.



Name the following acids and bases.

- |                                    |                         |                         |                            |
|------------------------------------|-------------------------|-------------------------|----------------------------|
| 9. HBr                             | <u>Hydrobromic acid</u> | 10. HNO <sub>2</sub>    | <u>Nitrous acid</u>        |
| 11. H <sub>2</sub> SO <sub>4</sub> | <u>Sulfuric acid</u>    | 12. KOH                 | <u>Potassium hydroxide</u> |
| 13. HClO <sub>4</sub>              | <u>Perchloric acid</u>  | 14. Ca(OH) <sub>2</sub> | <u>Calcium hydroxide</u>   |

Write the formulas for each of the acids and bases below.

- |                        |                                     |                       |                        |
|------------------------|-------------------------------------|-----------------------|------------------------|
| 15. barium hydroxide   | <u>Ba(OH)<sub>2</sub></u>           | 16. hydrosulfic acid  | <u>H<sub>2</sub>S</u>  |
| 17. rubidium hydroxide | <u>RbOH</u>                         | 17. hydroselenic acid | <u>H<sub>2</sub>Se</u> |
| 18. chromic acid       | <u>H<sub>2</sub>CrO<sub>4</sub></u> | 19. hydriodic acid    | <u>HI</u>              |

20. Show how the substances in #9 - 14 break into ions ( $\text{HCl} \rightarrow \text{H}^+ + \text{Cl}^-$ ).

- a.  $\text{HBr} \rightarrow \text{H}^+ + \text{Br}^-$   
 b.  $\text{HNO}_2 \rightarrow \text{H}^+ + \text{NO}_2^-$   
 c.  $\text{H}_2\text{SO}_4 \rightarrow 2\text{H}^+ + \text{SO}_4^{2-}$   
 d.  $\text{KOH} \rightarrow \text{K}^+ + \text{OH}^-$   
 e.  $\text{HClO}_4 \rightarrow \text{H}^+ + \text{ClO}_4^-$   
 f.  $\text{Ca}(\text{OH})_2 \rightarrow \text{Ca}^{2+} + 2\text{OH}^-$

Match the below

21. proton donor  
 22. proton acceptor  
 23. electron-pair donor  
 24. electron-pair acceptor  
 25. producer of  $\text{H}^+$  ions  
 26. producer of  $\text{OH}^-$  ions

**B**  
**D**  
**A**  
**E**  
**C**  
**F**

- a. Lewis base  
 b. Bronsted acid  
 c. Arrhenius acid  
 d. Bronsted base  
 e. Lewis acid  
 f. Arrhenius base

For the reactions below, identify as Arrhenius, Bronsted, or Lewis reactions then underline the acid and circle the base.

27.  $\text{HCl} + \text{Al}(\text{OH})_3 \rightarrow \text{AlCl}_3 + \text{H}_2\text{O}$  Arrhenius  
 28.  $\text{HCN} + \text{SO}_4^{2-} \rightarrow \text{HSO}_4^- + \text{CN}^-$  Bronsted  
 29.  $\text{AlCl}_3 + \text{Cl}^- \rightarrow \text{AlCl}_4^-$  Lewis  
 30.  $\text{HCl} + \text{NH}_3 \rightarrow \text{NH}_4^+ + \text{Cl}^-$  Bronsted  
 31.  $\text{H}_3\text{PO}_4 + \text{NaOH} \rightarrow \text{Na}_3\text{PO}_4 + \text{H}_2\text{O}$  Arrhenius

For each of the below, complete the reaction and write the two half reactions.

