

Solutions Test Study Guide

1. What is a heterogeneous mixture? What is a homogeneous mixture? (Give examples) *hetero-mixture that is not the same throughout (particles are dispersed either visually or microscopically) example-sand in water; mayonnaise, salad dressing; homo- mixture that is the same throughout (solution in which solute particles are completely dissolved in solvent) example-salt water, sweet tea*
2. Complete the table in order to explain the differences between a suspension, colloid, and solution.

<i>Property</i>	<i>Solution</i>	<i>Colloid</i>	<i>Suspension</i>
<i>Size of Dissolved/Suspended Particles</i>	<i>Not seen (completely dissolved)</i>	<i>microscopic</i>	<i>Large enough to be seen</i>
<i>Homogeneous or Heterogeneous</i>	<i>Homogeneous</i>	<i>Heterogeneous</i>	<i>Heterogeneous</i>
<i>Particles dissolve, stay suspended, or settle to the bottom</i>	<i>Dissolve</i>	<i>Suspended</i>	<i>Settle</i>

3. What are some unique properties that make a colloid identifiable? *Brownian Motion- the random motion of the dispersed particles in the colloid; Tyndall Effect- the scattering of light as it passes through a colloid (helps to distinguish between a solution and colloid when no lenses are available).*
4. What are the factors that affect how quickly a solute will dissolve in solution? *crushing (increases surface area in contact with solvent); stirring (increases contact between solute and solvent); heating (increased molecular motion increases rate of solubility); compatibility (like dissolves like)*
5. Why is water called the universal solvent? *it is used in more solutions than in other solvent*
6. What is the difference between unsaturated, saturated, and supersaturated solutions? *unsaturated- more solute can be dissolved in a given amount of solvent at a given temperature; saturated- the maximum amount of solute has dissolved in a given amount of solvent at a given temperature; supersaturated- more solute has been dissolved in a given amount of solvent than can normally be dissolved at a given temperature*
7. What “ion” is formed when acid is dissolved in water? What “ion” is formed when bases are dissolved in water? What scientist discovered this fact? *acid- hydronium ion (H_3O^+ or H^+); base- hydroxide ion (OH^-); Arrhenius*
8. Describe the pH scale. *0-7-14 (0-6 acid; 7 neutral; 8-14 base). Closer to 7 means the acid or base is weak*
9. Where are the strongest acids and bases found on the pH scale? *acids-0, bases-14*
10. What is the definition of a salt? *ionic compound made of metal from base and nonmetal from acid*

11. What are some examples of household acids? household bases? *household acids include aspirin, vinegar, citrus fruits, apples, sour milk, soda; household bases include soap (lye), milk of magnesia, limewater, ammonia, bleach, blood*
12. Is a disinfectant an acid or a base? What does it do? *base; kills germs and bacteria*
13. How does soap remove grease and oil from your skin? *acts as an emulsifier destroying the repulsion between oil/grease and water (which causes the oil to be dissolved in water)*
14. What pH color is generally associated with an acid? base? *red; blue*
15. What is the taste of an acid? a base? *sour; bitter*
16. What group is attached to the structure of all organic acids? *carboxyl (-COOH)*
17. What are the acid names of these common items:
 - a. Apples- *malic*
 - b. Aspirin- *acetylsalicylic*
 - c. Ants- *formic*
 - d. Sour Milk- *lactic*
 - e. Vinegar- *acetic*
18. How do bases feel? *slippery*
19. What does amphoteric mean? *can act as an acid or a base (water)*
20. What are the common names and uses of the following bases?
 - a. $\text{Mg}(\text{OH})_2$ - *milk of magnesia (laxative)*
 - b. NaOH - *lye (soap)*
 - c. $\text{Ca}(\text{OH})_2$ - *limewater (leather production)*
21. What are two examples of industrial (inorganic acids)? What are they used in? *HCl (hydrochloric), used in pickling steel, cleaning brick, stomach; H_2SO_4 (sulfuric) used in agriculture and many manufactured products; battery acid*
22. How did Bronsted-Lowry define an acid? a base? *acid-proton donor; base-proton acceptor*
23. How did Lewis define an acid? a base? *acid- electron acceptor; base- electron donor*
24. What is the formula to determine concentration? *concentration = mass/volume*
25. What is the concentration of a solution that dissolves 25 grams of solute in 1.2 liters? *21 g/L*
26. What is the mass of a solute in 0.50 liters of a 2.2 g/L solution? *1.1 g*
27. How many liters are in a solution with a 0.5 g/L concentration that contains 15 grams of solute? *30 L*
28. Answer the following questions using the table to the right:
 - a. How much KCl will dissolve in 100 g of water at 60° C? at 200 g of water? *45 g; 90 g*
 - b. Which solute is the least soluble at 10° C? *KClO_3*
 - c. Which solute is the most soluble at 10° C? *KI*

