Unit 14 Worksheet Solutions, Acids & Bases Do not write on this paper. Put all answers on a separate sheet of notebook paper.

Solutions

1. Solubility refers to the grams of _solute_ per 100 g of _solvent__.
2. Loose sugar dissolves much faster than a sugar cube because loose sugar has _a greater surface area_
3. Sugar will dissolve more quickly in iced tea if you stir it because stirring _ allows dissolved molecules to diffuse through the tea _
4. You can make a solute dissolve more quickly in a solvent by __ heating the solvent _
5. Water can dissolve charged particles because _ its atoms have partial charges _
6. An unsaturated solution is one that _ can dissolve more solute at the current conditions _
7. What happens when a supersaturated solution cools down? The solute will precipitate out of the solution
8. In a solution, the substance that is being dissolved is the _ solute _.
9. A substance that does NOT conduct an electric current when it forms a solution is a(n) _ nonelectrolyte _.
10. A solution that contains all of the solute it can hold at a given temperature is __saturated _.
11. Increasing the surface area of a solid _ speeds the rate of solution _.
12. When a gas is dissolved in a liquid, the gas dissolves faster if the liquid is _cooled _.
13. The concentration of solution that contains a large amount of solute in the solvent could be described as _ concentrated _.
14. An alloy is an example of a _ solid _ solution.
15. A molecule that is positively charged on one end and negatively charged on the other end is __polar _.
16. The amount of solute that can be dissolved in a specific amount of solvent at a given temperature is its _ solubility _.
17. As sugar dissolves in water, sugar molecules _diffuse_, or spread throughout the entire solution.
18. A solute's __solubility_ can often be increased by heating.
19. Shaking or stirring a solution will make a solute _dissolve_ more quickly
20. A solute will dissolve more quickly if you increase its _surface area_ by breaking it into small pieces.
21. Solutes dissolve faster if the solvent is _Heated / hot _.
22. Water is a(n) _polar_ compound because its shared electrons are not spread evenly throughout each molecule.
23. Because so many substances can dissolve in water, it is often referred to as the _universal solvent _.
24. A(n) _supersaturated_ solution is an unstable system.
25. A saturated solution contains the greatest quantity of _solute_ that will dissolve in a given quantity of _sovent _.
26. Soap works because the negatively charged end of the hydrocarbon chain dissolves in _water _, whereas the neutral end dissolves in _oil _.
27. A crystal of solute was dropped into a solution, and it dissolved. The original solution was unsaturated _.
28. If a crystal of solute is dropped into a solution and other crystals appear, the solution was _supersaturated _.
29. Stirring _increases_ the speed of dissolving of a solid in a liquid
30. Explain what happens when a crystalline solid dissolves in water. The crystalline solid dissociates into positive and negative ions; positive ions are attracted to the negative end of water molecule, negative ions to the positive end
31. Sugar is a molecule that does not ionize when dissolved in water. Will a sugar solution conduct electricity? No; sugar is a nonelectrolyte
32. Explain what it means to say that a supersaturated solution is an unstable system. Supersaturated solutions hold more dissolved solute than is specified by their solubility. They can only do so in special circumstances, such as if the solution is heated. They are unstable because as the solution cools, or as more solute is added, the excess solute will rapidly precipitate out

Acids and Bases

33. Acids are substances that form hydronium ions when dissolved in water _
34. When dissolved in water, all acids will _ conduct electricity _
35. A solution that is mildly acidic would have a pH of approximately 6_
36. The pH of a substance is a measure of its hydronium ion concentration

37. The label on a bottle indicates that the substance inside has a pH of 13. This tells you that the substance is _ strongly basic _
38. When a solution of an acid reacts with a solution of a base, hydronium ions react with hydroxide ions to form _ water _
39. When a solution of an acid reacts with a solution of a base, the pH of the resulting solution depends on the amounts of acid and base used _
40. What is a salt? An ionic compound that does not contain oxide or hydroxide anions
41. A(n) _ acid _ is a substance that produces H^+ ions in a water solution.
42. A(n) _ base _ is a substance that produces OH^- ions in a solution.
43. _ pH _ measures how acidic or basic a substance is.
44. _ Indicators _ change color in the presence of an acid or a base.
45. A bitter taste and a slippery feel are clues that a solution is probably a(n) _ base _.
46. _ Strength _ of a solution refers to the ease with which an acid or base forms ions in solution.
47. A base that only partly ionizes in a solution is a _ weak _ base.
48. pH measures the _ concentration _ of hydronium ions in a solution.
49. Coffee has a pH of about 5. Coffee is _ somewhat acidic _.
50. A(n) _ indicator _ is a compound that can change color in a solution, depending on whether the solution is acidic or basic.
51. An acid is a substance that donates hydrogen ions (H^+) to form _ hydronium _ ions when dissolved in water.
52. A(n) _ base _ is a substance that either contains hydroxide ions (OH^-) or reacts with water to form hydroxide ions.
53. Apple juice has a pH of 3, and stomach acid has a pH of 2. This means that stomach acid is _ 10 _ times more acidic than apple juice.
54. pH is a measure of the _ hydronium ion concentration _ of a solution.
55. In a neutralization reaction, hydronium ions react with hydroxide ions to produce _ water _.
56. Salts are _ ionic compounds _ formed when acids and bases react.
57. Because lye contains hydroxide ions, it is a _ basic _ compound.
58. What factor determines the strength of an acid or a base? how completely a compound separates into ions when dissolved in water
59. How is a weak acid different from a strong acid? weak acid—partly ionizes in solution; strong acid—completely, or almost completely, ionizes in solution
60. How is the concentration of an acid or base different from the strength of an acid or base? Concentration refers to the amount of acid or base dissolved in solution. Strength refers to how completely the acid ionizes in solution
61. What is an acid? a substance that produces hydrogen ions, H^+, in a water solution
62. What is a base? a substance that forms hydroxide ions, OH^-, in a water solution, or any substance that accepts H^+ from acids
63. List two common acids that are NOT harmful to the body when ingested and a product in which each is used. acetic acid—vinegar; acetylsalicylic acid—aspirin; ascorbic acid—vitamin C; carbonic acid—carbonated drinks; phosphoric acid—soft drinks
64. List one common base that is NOT harmful to the body when ingested and a product in which it is used. aluminum hydroxide—deodorant, antacid; magnesium hydroxide—milk of magnesia
65. What is pH? a measure of the concentration of hydronium ions in a solution
66. Identify the following pHs as a strong base, a weak acid, a weak base, or a strong acid: 2, 5, 8, 11. strong acid—2; weak acid—5; weak base—8; strong base—11

Tell if the following is an acid (A), a base (B) or could be either an acid or a base (AB)

67. In solution, it feels slippery. B
68. It has a bitter taste. B
69. It has the chemical formula HNO_3. A
70. It can be corrosive. AB
71. It reacts with an indicator to produce a change in its color. AB
72. It has a sour taste. A
73. It has the chemical formula $Ca(OH)_2$. B
74. It forms hydronium ions in water. A