

# Prep for Basic Chemistry: Competency 10 Practice

1. A **solution** is the...
  - amount of a substance that dissolves in a specific amount of a solvent to form a saturated solution at a given temperature.
  - ratio of number of moles of solute to the total number of moles in a solution.
  - homogeneous mixture of one or more substances (solutes) dissolved into a solvent in single phase.
2. The **solute** is the...
  - dissolved particles in a solution.
  - number of moles of solute dissolved in one kilogram of solvent.
  - law that states that the solubility of a gas in a liquid is directly proportional to the partial pressure of that gas above the liquid at a given temperature.
3. **Concentration** is...
  - measure of the quantity of solute dissolved in a given quantity of solvent or solution.
  - number of moles of solute dissolved in one liter of solution.
  - solution that contains the maximum amount of dissolved solute at a specific temperature and pressure.
4. The **solvent** is ...
  - dissolving medium in a solution.
  - measure of the quantity of solute dissolved in a given quantity of solvent or solution.
  - the ratio of number of moles of solute to the total number of moles in a solution.
5. Which of the following is the correct unit of measurement for molarity?
  - moles/liter
  - moles/kilogram
  - moles
  - grams/mole
6. What is the molarity of a 5.2 liter solution that contains 100.0 grams of NaCl?
  - 1.71
  - 1.00
  - 0.33
  - 0.8.4
7. What is the percent by volume of acetone when 30 mL of acetone is diluted with water to a total solution volume of 600 mL?
  - 20%
  - 5%
  - 30%
  - 1%

8. How many moles of NaCl are in 3.5 liters of 0.8 M NaCl solution?
- A 4.3  
 B 0.23  
 C 4.4  
 D 2.8
9. What volume of a stock solution of 4.0 M HCl is needed to make 500 ml of 0.6 M HCl?
- A 50 ml  
 B 200 ml  
 C 300 ml  
 D 75 ml
10. How many grams of solute S is needed to prepare 12 liters of 6.8% S (mass/volume) solution?
- A 0.816  
 B 816  
 C 8.16  
 D 81.6
11. What is the molarity of a solution containing 12 g of NaCl dissolved in 60 g of H<sub>2</sub>O?
- A 3.42 mol/ kg  
 B 0.205 mole  
 C 3.42 mol/liter  
 D 3.42 M
12. When a solution is diluted, the total number of moles of solute remains the same.
- A True  
 B False
13. Molarity is the number of moles of solute in one kilogram of solvent.
- A True  
 B False
14. **Molarity (M)** is...
- A amount of a substance that dissolves in a specific amount of a solvent to form a saturated solution at a given temperature.  
 B solution that contains less solute than a saturated solution under the same conditions.  
 C number of moles of solute dissolved in one liter of solution.
15. The pH of solution A is 9, solution B is 12, solution C is 5, and solution D is 7. Which of the following correctly arranges the solutions from most acidic to basic?
- A B → D → C → A  
 B B → A → D → C  
 C C → D → A → B  
 D A → B → C → D

16. How many moles of  $\text{H}_2\text{SO}_4$  are required to neutralize 2 moles of  $\text{NaOH}$ ?
- A 2 moles
  - B 4 moles
  - C 1 mole
  - D 3 moles
17. **Titration** is the...
- A process of adding and measuring the amount of a solution of known concentration to determine the concentration of another solution.
  - B point at which an acid-base indicator changes color in a titration.
  - C device that determines the pH of a solution by measuring the voltage between a glass electrode and reference electrode placed in the solution.
18. If the  $[\text{H}^+]$  of cranberry juice is  $1 \times 10^{-5}$  and the  $[\text{H}^+]$  of orange juice is  $1 \times 10^{-4}$ , which juice is more acidic? What is the pH difference between these two juices? (2 points)
- A cranberry juice; 1
  - B orange juice; 10
  - C orange juice; 1
  - D cranberry juice; 10
19. The pH of solution 1 is 2.0 and the pH of solution 2 is 4.0. The hydrogen ion concentration in solution 1 is \_\_\_\_\_ than that of solution 2.
- A 100 times higher
  - B 2 times lower
  - C 100 times lower
  - D 2 times higher
20. What is the pH value of a solution of 0.00010 M  $\text{HCl}$ ?
- A 4.0
  - B 1.0
  - C 2.0
  - D 5.0
21. The higher the pH value, the less acidic the solution.
- A True
  - B False
22. A basic solution has a higher concentration of hydrogen ions than hydroxide ions.
- A True
  - B False
23. If 60g of salt are dissolved in 100g of water:
- a. Grams of solute= \_\_\_\_\_
  - b. Grams of solvent= \_\_\_\_\_
  - c. Grams solution= \_\_\_\_\_
24. 10.0g of  $\text{NaCl}$  are dissolved in 80g of solvent. What is the percentage by weight of this solution? \_\_\_\_\_

25. 40mL of alcohol are dissolved in enough water to make 160mL of solution. What is the percentage by volume of this solution? \_\_\_\_\_

26. What will be the final concentration of 160mL of a 0.8 M solution that is diluted to 640mL?

\_\_\_\_\_

27. 43.8 mL of a 0.95 M HCl solution is needed to titrate 56.2 mL of a basic solution. What is the molarity of the basic solution?

\_\_\_\_\_

Total possible points= 32 Your points= \_\_\_\_\_ % score= \_\_\_\_\_