1. What is the total number of moles of NaCl(s) needed to make 3.0 liters of a 2.0 M NaCl solution?

   A) 1.0 mol B) 8.0 mol
   C) 6.0 mol D) 0.70 mol

2. How many grams of KOH are needed to prepare 250. milliliters of a 2.00 M solution of KOH (formula mass = 56.0)?

   A) 1.00 g B) 2.00 g
   C) 28.0 g D) 112 g

3. What is the total number of grams of HI in 0.500 liter of 1.00 M HI?

   A) 1.00 g B) 0.500 g
   C) 64.0 g D) 128 g

4. When 20. milliliters of 1.0 M HCl is diluted to a total volume of 60. milliliters, the concentration of the resulting solution is

   A) 1.0 M B) 0.50 M
   C) 0.33 M D) 0.25 M

5. What is the concentration of $O_2(g)$, in parts per million, in a solution that contains 0.008 gram of $O_2(g)$ dissolved in 1000. grams of $H_2O(l)$?

   A) 8 ppm B) 80 ppm
   C) 800 ppm D) 0.8 ppm

6. The concentration of a solution can be expressed in

   A) joules per gram
   B) grams per kelvin
   C) parts per million
   D) milliliters per minute

7. The molarity of an aqueous solution of NaCl is defined as the

   A) grams of NaCl per liter of solution
   B) moles of NaCl per liter of water
   C) moles of NaCl per liter of solution
   D) grams of NaCl per liter of water

8. Based on your reference tables, which compound could form a concentrated solution?

   A) Ag_2CO_3 B) AgCl
   C) $AgNO_3$ D) AgBr

9. Which preparation produces a 2.0 M solution of $C_6H_{12}O_6$? [molecular mass = 180.0]

   A) 90.0 g of $C_6H_{12}O_6$ dissolved in 1000. mL of solution
   B) 90.0 g of $C_6H_{12}O_6$ dissolved in 500.0 mL of solution
   C) 180.0 g of $C_6H_{12}O_6$ dissolved in 1000. mL of solution
   D) 180.0 g of $C_6H_{12}O_6$ dissolved in 500.0 mL of solution

10. What is the concentration expressed in parts per million of a solution containing 30.0 grams of $NaNO_3$ in 70.0 grams of H_2O?

    A) 3.33×10^6 ppm B) 3.00×10^5 ppm
    C) 2.33×10^6 ppm D) 4.29×10^5 ppm

11. Which solution is most concentrated?

    A) 0.1 mole of solute dissolved in 400 ml of solvent
    B) 0.2 mole of solute dissolved in 300 ml of solvent
    C) 0.3 mole of solute dissolved in 200 ml of solvent
    D) 0.4 mole of solute dissolved in 100 ml of solvent

12. If 0.50 liters of a 2.0M HCl is diluted with H_2O to a volume of 1.0 liters, the molarity of the new solution will be

    A) 1.0 M B) 2.0 M
    C) .25 M D) .50 M

13. Which unit can be used to express solution concentration?

    A) mol/s B) J/mol
    C) L/mol D) mol/L

14. Which unit can be used to express the concentration of a solution?

    A) ppm B) L/s C) kPa D) J/g

15. Which solution is the most concentrated?

A) 1 mole of solute dissolved in 1 liter of solution
B) 2 moles of solute dissolved in 3 liters of solution
C) 6 moles of solute dissolved in 4 liters of solution
D) 4 moles of solute dissolved in 8 liters of solution

16. A 2400.-gram sample of an aqueous solution contains 0.012 gram of NH_3. What is the concentration of NH_3 in the solution, expressed as parts per million?

A) 5.0 ppm B) 15 ppm
C) 20. ppm D) 50. ppm

17. A 3.0 M HCl(aq) solution contains a total of

A) 3.0 grams of HCl per mole of solution
B) 3.0 moles of HCl per liter of solution
C) 3.0 moles of HCl per mole of water
D) 3.0 grams of HCl per liter of water

18. How many moles of solute are contained in 200 milliliters of a 1 M solution?

A) 0.2 B) 0.8 C) 1 D) 200

19. What is the molarity of 1.5 liters of an aqueous solution that contains 52 grams of lithium fluoride, LiF, (gram-formula mass = 26 grams/mole)?

A) 1.3 M B) 2.0 M
C) 3.0 M D) 0.75 M

20. What is the molarity of a solution of NaOH if 2 liters of the solution contains 4 moles of NaOH?

A) 0.5 M B) 2 M
C) 8 M D) 80 M

21. If 100. milliliters of a 1.0-molar NaCl solution is evaporated to 25 milliliters, what will be the concentration of the resulting NaCl solution?

A) 0.25 M B) 2.0 M
C) 0.50 M D) 4.0 M

22. How many grams of KOH should be dissolved in water to make 2000.0 grams of a 10.0 ppm solution?

A) 2.0×10^{-1} g B) 2.0×10^{-3} g
C) 2.00 g D) 2.0×10^{-2} g

23. How many grams of NaCl are needed to be dissolved in water to make 1.0 gram of a 100.0 ppm solution?

A) 1.0×10^{-1} g B) 1.0×10^{-2} g
C) 1.0×10^{-4} g D) 1.0×10^{-3} g

24. Which type of concentration is calculated when the grams of solute is divided by the grams of the solution, and the result is multiplied by 1,000,000?

A) parts per million
B) percent by mass
C) percent by volume
D) molarity

25. What is the concentration expressed in parts per million of a solution containing 5.0 grams of NH_4Cl in 95.0 grams of H_2O?

A) 2.0×10^7 ppm B) 5.3×10^4 ppm
C) 1.9×10^7 ppm D) 5.0×10^4 ppm

26. The concentration of a solution can be expressed in

A) joules per kilogram
B) kelvins
C) milliliters
D) moles per liter

27. What is the concentration of a solution which contains 1 mole of $CaCl_2$ dissolved in 2,000 milliliters of solution?

A) 1 M B) 2 M
C) 0.5 M D) 0.25 M

28. What is the total number of grams of NaOH (formula mass = 40.) needed to make 1.0 liter of a 0.20 M solution?

A) 20. g B) 2.0 g C) 80. g D) 8.0 g