Mole Worksheet

1. How many moles of $MgCO_3$ are in 10.0 g of the substance?

2. What is the mass of 0.70 mol of Al_2O?

3. How many moles of NaOH are in 300.0 g of the substance?

4. How many molecules are in 25 g of $Mg(NO_3)_2$?

5. How would you prepare 2.4 L of 0.50 M solution of LiH?

6. How many molecules are in 1.0 L of water? (density of water is 1 g/mL

7. What volume of a 2.0 M solution of Na contains 13 g of solute?

8. What volume of a 1.5 M solution of KOH contains 2.24 g of solute?

9. What is the molar mass of PF_3?

10. How many moles are in 400 g of H_2O?

11. How many hydrogen atoms are in 13 g ofH_2SO_4?

12. There are 200 g/ 500 mL of sucrose $C_{11}H_{22}O_{11}$ in a Coke can. What is the molar concentration of the drink?

13. What mass of solute must be used to prepare 350 mL of a HCl solution at a concentration of 0.75 mol/L?

14. How many grams H_2SO_4 are in 100 mL of a 0.3 M solution?

15. How much HCH_3CO_2 is required to make 500.0 mL of a 0.25 mol/L solution?

16. Which of the following solutions has the lowest g/L concentration?
Solution 1- 1.5 moles of NaCl in 1.5 litres of solution
Solution 2- 4.4 moles of Al_2O_3 in 30 mL of solution
Solution 3- 5.2 moles of NaF in 5.5 lites of solution

17. How many moles of $CaCO_3$ are in 4.0 L of a 1.5 M solution?

18. Explain the procedure used to prepare 5.9 L of a 3.5 M solution of $ZnSO_4$?

19. How many molecules are in 10 g of $CaCl_2$?

20. There are 5 g/ 1 L of salt KBr in a Gatorade drink. What is the molar concentration of the drink?

21. How many molecules are in 40.0 g of LiBr?

22. How many moles and molecules are in 10.0 g of $CaCO_3$?

23. What mass of NaCl must be used in order to make 100.0 mL of a 0.2 M solution?

24. How many chlorine atoms are in 14 g of NaCl?

25. Calculate the mass of NH_3OH in 200.0 mL of a 0.40 M solution.

26. Calculate the molarity of a solution by dissolving 100.0 g of KBr in water to make a 2.0 L solution.

27. What volume of a 2.5 mol/L solution of PCl_3 contains 7.0 g of solute?

28. How much potassium iodide is needed to make 250 mL of a 0.25 mol/L solution?

29. There are 10 g/ 2 L of salt NaCl in a Gatorade drink. What is the molar concentration of the drink?

30. What volume of a 7.0 mol/L solution of H_2O contains 18 g of solute?

31. How many molecules are in 3.0 g of NaCl?

32. Which of the following solutions has the highest g/L concentration?
Solution 1- 3.5 moles of Br_2 in 2.1 litres of solution
Solution 2- 1.0 moles of NaOH in 3 litres of solution
Solution 3- 5.6 moles of HCl in 5 lites of solution

33. How many molecules are in 36 g of NaCl?

34. Aspartame is an artificial sweetener that is 160 times sweeter than sucrose. Its molecular formula is $C_{14}H_{18}N_2O_5$.
    a- Calculate the molecular weight of aspartame.

    b- How many moles of the molecule are in 10 g of aspartame?

    c- What is the mass in grams of 1.56 mol of aspartame?

    d- How many molecules are in 5.0 mg of aspartame?

e- How many atoms of nitrogen are in 1.2 g of aspartame?

35. The molecular formula of acetylsalicylic acid (aspirin) is $C_9H_8O_4$.
    a- Calculate the molar mass of aspirin.

    b- A typical aspirin contains 500 mg of $C_9H_8O_4$. How many moles of $C_9H_8O_4$ and molecules of aspirin are in a 500 mg tablet?

36. Calculate the molarity of a solution prepared by bubbling 11.5 g of solid NaOH in enough water to make 1.5 L of solution.

37. Typical blood serum is about 0.14 M NaCl. What volume of blood contains 1.0 mg of NaCl?

38. How many molecules are in 2.0 g of CCl_4?

39. To analyze the alcohol content of a certain wine, a chemist needs 1.0 L of aqueous 0.20 M $K_2Cr_2O_7$ (potassium dichromate) solution. How much solid $K_2Cr_2O_7$ must be weighed out to make this solution?