10-1 Practice Problems (3)

1. What is the atomic mass of Zinc?

2. Methylene Chloride (CH_2C1_2) is used as a solvent in paint strippers. What is the formula mass of Methylene Chloride?

3. What is the atomic mass of Nitrogen?

4. Ammonia is a common household cleaning agent. What is the formula mass of Ammonia?

5. Sodium Hypochlorite (NaClO) is the active ingredient in household bleach. What is the formula mass of Sodium Hypochlorite?

6. What is the atomic mass of Neon?

7. Sodium Chloride is common table salt What is the formula mass of Sodium Chloride?

8. What is the atomic mass of Uranium?

9. Nitric Acid is a strong acid. What is the formula mass of Nitric Acid?

10. What is the atomic mass of Silver?

10-1 Practice Problems (Continued)

Calculate the molar mass for each of the following compounds.

11. Methylamine (CH_3NH_2)

12. Benzene (C_6H_6)

13. Propane (C_3H_8)

14. Ethandiol ($C_2H_6O_2$)

15. Chloroform ($CHCl_3$)

18. Silver Chloride (AgCl)

17. Sodium Hydroxide (NaOH)

18. Copper(II) Sulfate ($CuSO_4$)

19. Octane (C_8H_{18})

20. Tribromosilane (Br_3HSi)

10-1 Review and Reinforcement

Find the formula mass of each of the following compounds. Show all your work.

1. $CaCO_3$

2. $MgSO_4$

3. NaOH

4. KCl

5. BaF_2

Find the molar mass of each of the following compounds. Show all your work.

6. Nitric Acid

7. Ammonia

8. Calcium Sulfate

9. Potassium Sulfide

10. Iron(III) Chloride

10-2 Practice Problems

1. Find the mass of 0.89-mol of $CaCl_2$.

2. A bottle of $PbSO_4$ contains 158.1 g of the compound. How many moles of $PbSO_4$ are in the bottle?

3. Find the mass of 1.112-mol of HF.

4. Determine the number of moles of C_5H_{12} that are in 362.8-g of the compound.

5. Find the mass of 0.159 mol of SiO_2.

6. You are given 12.35-g of $C_4H_8O_2$. How many moles of the compound do you have?

7. Find the mass of 3.66-mol of N_2.

8. A bottle of $KMnO_4$ contains 66.38-g of the compound. How many moles of $KMnO_4$ does it contain?

9. Determine the number of atoms that are in 0.58-mol of Se.

10. How many moles of Barium Nitrate contain 6.80×10^{24}-formula units?

11. Determine the number of atoms that are in 1.25-mol of O_2.

12. How many moles of Magnesium Bromide contain 5.38×10^{24}-formula units?

13. Determine the number of formula units that are in 0.688-mol of $AgNO_3$

14. How many moles of Ethane (C_2H_6) contain 8.46×10^{24}-formula units?

15. Determine the number of formula units that are in 1.48-mol of NaF.

16. How many formula units are in 3.5-g of NaOH?

10-2 Practice Problems (Continued)

17. If you burned 6.10 x 10^{24}-molecules of Ethane (C_2H_6), what mass of Ethane did you burn?

18. How many formula units are in 5.1-g of TiO_2?

19. What is the mass of 3.62 x 10^{24}-molecules of methanol (CH_3OH)?

20. How many formula units are in 1.4-g of $PbCl_2$?

21. Determine the mass of 2.94 x 10^{24}-molecules of Decane ($C_{10}H_{22}$).

22. How many formula units are in 5.6-g of H_2S?

23. A container with a volume of 893-L contains how many moles of air at STP?

24. A chemical reaction produces 0.37-mol of N_2 gas. What volume will that gas occupy at STP?

25. A canister with a volume of 694-L contains how many moles of Oxygen at STP?

26. A chemical reaction produces 13.8-mol of CO gas. What volume will that gas occupy at STP?

27. A tube with a volume of 3.68-L contains how many moles of neon gas at STP?

28. A chemical reaction produces 0.884-mol of H_2S gas. What volume will that gas occupy at STP?

29. A container with a volume of 101-L contains how many moles of Argon gas at STP?

30. A chemical reaction produces 138-mol of HBr gas. What volume will that gas occupy at STP?

10-3 Practice Problems

1. Find the percent composition of a compound that contains 1.94-g of C, 0.48-g of H, and 2.58-g of S in a 5.00-g sample of the compound.

2. A sample of an unknown compound with a mass of 0.847-g has the following composition: 50.51-% F and 49.49-% Fe. When this compound is decomposed into its elements, what mass of each element would be recovered?

3. Find the percent composition of a compound that contains 2.63-g of C, 0.370-g of H, and 0.580-g of O in a 3.58-g sample of the compound.

4. A sample of an unknown compound with a mass of 2.876-g has the following composition: 66.07-% C, 6.71-% H, 4.06-% N, and 23.16-% O. What is the mass of each element in this compound?

5. Find the percent composition of compound that contains 2.7369-g of Cl, 0.4116-g of O, and 0.7971-g of P in a 3.9460-g sample of the compound.

6. Find the percent composition of a compound that contains 1.51-g of Cr, 1.13-g of K, and 1.62-g of C in a 4.26-g sample of the compound.

7. A sample of a compound that has a mass of 0.432-g is analyzed. The sample is found to be made up of O and F only. Given that the sample contains 0.128-g of O, calculate the percent composition of the compound.

8. What is the percent composition of a Carbon-Oxygen compound, given that a 95.2-g sample of the compound contains 40.8-g of C and 54.4-g of O?

9. What is the percent composition of a Sulfur-Chlorine compound, given that a 30.9-g sample of the compound contains 9.63-g of S and 21.3-g of Cl?

10. Determine the empirical formula of a compound containing 2.644-g of Au and 0.476-g of Cl.

11. Determine the empirical formula of a compound containing 0.928-g of Ga and 0.412-g of P.

12. Determine the empirical formula of a compound containing 1.723-g of C, 0.289-g of H, and 0.459-g of O.

10-3 Practice Problems (Continued)

13. Find the empirical formula of a compound, given that the compound is found to be 47.9-% Zn and 52.1-% Cl by mass.

14. Find the empirical formula of a compound, given that a 48.5-g sample of the compound contains 1.75-g of C and 46.75-g of Br.

15. Determine the empirical formula of a compound containing 20.23-% Al and 79.77-% Cl.

16. Determine the empirical formula of a compound containing 24.74-% K, 34.76-% Mn, and 40.50-% O.

17. Determine the empirical formula of a compound containing 4.288-g of C and 5.712-g of O.

18. Determine the empirical formula of a compound containing 2.16-g of Al, 3.85-g of S, and 7.68-g of O.

19. Determine the empirical formula of a compound containing 3.611-g of Ca and 6.389-g of Cl.

20. Find the molecular formula of a compound that contains 42.56-g of Pd and 0.80-g of H. The molar mass of the compound is 216.8-g/mol.

21. Octane, a compound of H and C, has a molar mass of 114.26-g/mol. If one mole of the compound contains 18.17-g of H, what is its molecular formula?

22. Find the molecular formula of a compound that contains 30.45-% N and 69.55-% O. The molar mass of the compound is 92.02-g/mol.

23. Find the molecular formula of a compound, given that a 212.1-g sample of the compound contains 42.4-g of H and 169.7-g of C and the molar mass is 30.0-g/mol.

24. A compound is known to have a molar mass of 391.5-g/mol. Find the molecular formula of the compound, given a 310.8-g sample contains only B and I. The mass of the I in the sample is found to be 302.2-g.

25. Find the molecular formula of a compound that contains 56.36-g of O and 43.64-g of P. The molar mass of the compound is 283.9-g/mol.