

Name: _____

Unit 4 Practice Sheet (Chapter 10, 11, and 12)

*Chapter 10:

1. What is the molar mass of the following substances?
 - a. iron (III) acetate
 - b. aluminum nitrate
2. Make the following conversions:
 - a. Convert 97.3g lithium oxide to moles.
 - b. Convert 12.7 mol of silicon dioxide to molecules.
 - c. Convert 87.6L of nitrogen to moles at STP.
3. What is the percent composition of the following compounds?
 - a. A sample is found to contain 40.7g of carbon, 12.3g of hydrogen, and 16.9g of oxygen.
 - b. MgSO_4
4. What is the empirical formula for the following? (This is not a problem, just reduce the subscripts if possible)
 - a. $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
 - b. H_2O_2
 - c. P_4O_{10}
5. Calculate the empirical formula for the following compounds:
 - a. 75% C and 25% H
 - b. 40.92% C, 4.58% H, and 54.50% O
6. Calculate the molecular formula for a compound with an empirical formula of CH_2 and a molar mass of 70 g/mol.

*Chapter 11:

Balance the following equations.

7. $\text{PbO}_2 \rightarrow \text{PbO} + \text{O}_2$
8. $\text{Fe}(\text{OH})_3 \rightarrow \text{Fe}_2\text{O}_3 + \text{H}_2\text{O}$
9. $(\text{NH}_4)_2\text{CO}_3 \rightarrow \text{NH}_3 + \text{H}_2\text{O} + \text{CO}_2$
10. $\text{NaCl} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{HCl}$
11. $\text{C}_6\text{H}_6 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
12. $\text{Ca}_3\text{P}_2 + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{PH}_3$
13. $\text{SrBr}_2 + (\text{NH}_4)_2\text{CO}_3 \rightarrow \text{SrCO}_3 + \text{NH}_4\text{Br}$

Write the type of each reaction and predict the products. Be sure to balance the equation. (Hint: Zinc has a +2 charge.)

14. $\text{Zn} + \text{AgNO}_3 \rightarrow$

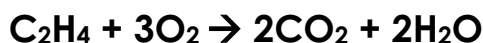
15. ___ Mg + ___ O₂ →
16. ___ C₂H₆ + ___ O₂ →
17. ___ H₂C₂O₄ + ___ KOH →
18. ___ Ag₂O →

***Chapter 12:**

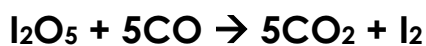
19. What is conserved in a chemical reaction? (List 2)
20. What unit should you think of when using coefficients?
21. How many moles of oxygen are needed to make 14.7 moles of water?



22. How many moles of carbon dioxide are produced from 20.3 moles of C₂H₄?



23. What are the 3 steps to a stoichiometry problem?
24. What are the 3 conversion factors for a mole?
25. How many grams of iodine are produced from 68.7L of carbon monoxide?



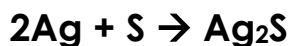
26. How many molecules of I₂O₅ are required to produce 3.41 mol of carbon dioxide?



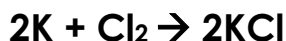
27. If you start with 50g of copper (II) chloride and 50g of sodium nitrate, then how many moles of copper (II) nitrate will be produced? Identify the limiting and excess reagents.



28. A student reacts 1.3 mol of silver with 3.7 mol of sulfur, how many moles of silver (I) sulfide will be produced? Identify the limiting and excess reagents.



29. When 50g of chlorine reacts with potassium, 1.15 mol of potassium chloride is produced. What is the percent yield of the reaction?



30. When 275g of sodium chlorate decomposes, 80.11L of oxygen is produced. What is the percent yield of the reaction?



