

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Period: \_\_\_\_\_

## 12.1 – The Arithmetic of Equations

1. How are recipes and balanced chemical equations similar?
2. A bookcase is to be built from 3 shelves (Sh), 2 side boards (Sb), 1 top (T), 1 base (B), and 4 legs (L). Write a “balanced equation for the construction of this bookcase.
3. Why do we need balanced chemical equations?
4. What is stoichiometry?
5. From what elements is ammonia produced? How is it used?
6. How can the following quantities be used in chemical equations?

Number of Atoms –

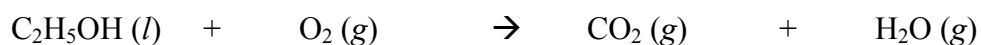
Number of Molecules –

Moles –

Mass –

Volume –

7. The coefficients of a balanced chemical equation tell you the relative number of moles of \_\_\_\_\_ and \_\_\_\_\_ in a chemical reaction.
8. True or False – A balanced chemical equation must obey the law of conservation of mass. \_\_\_\_\_
9. Balance the following equation **and** show that the balanced equation obeys the law of conservation of mass.

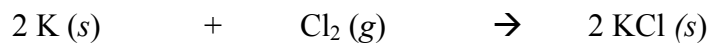


## 12.2 – Chemical Calculations

10. What is essential for all calculations involving amounts of reactants and products?
11. What is a mole ratio?

12. What are mole ratios used for?

13. The equation for the formation of potassium chloride is as follows. Write the six possible mole ratios for this equation.



1.

2.

3.

4.

5.

6.

14. The amount of a substance is determined by measuring its mass in \_\_\_\_\_.

15. What steps must be followed to solve a mass-mass stoichiometry problem

1.

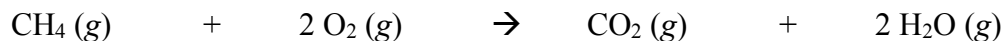
2.

3.

16. Chemicals always react in ratios of \_\_\_\_\_.

17. In any problem relating to stoichiometric calculations, the given quantity is first converted to \_\_\_\_\_.

18. The combustion of methane produces carbon dioxide and water. The chemical equation for this reaction is:



Write the three conversion factors you would use to find the volume of carbon dioxide obtained from 1.5 L of oxygen.

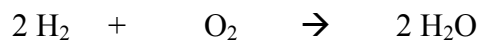
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### 12.3 – Limiting Reagent and Percent Yield

19. What is a limiting reagent?

20. The reagent that is not completely used up is called the \_\_\_\_\_ reagent.

21. The chemical equation for the formation of water is:



If I have 4 molecules of  $\text{H}_2$  and 4 molecules of  $\text{O}_2$ , which is my limiting reagent and why?

22. What is the theoretical yield?

23. What is the difference between theoretical yield and actual/percent yield?

24. What are four factors that could cause percent yield to be lower than 100%

- 1.
- 2.
- 3.
- 4.