

1. A balanced chemical equation allows one to determine the

- a) mole ratio of any two substances in the reaction
- b) energy released in the reaction
- c) electron configuration of all elements in the reaction
- d) mechanism involved in the reaction

2. The coefficients in a chemical equation represent the

- a) masses, in grams, of all reactants and products.
- b) relative numbers of moles of reactants and products.
- c) number of atoms in each compound in a reaction.
- d) number of valence electrons involved in the reaction.

3. In the reaction  $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$  what is the mole ratio of nitrogen to ammonia?

- a) 1:1
- b) 1:2
- c) 1:3
- d) 2:3

4. In the reaction  $2\text{Al}_2\text{O}_3 \rightarrow 4\text{Al} + 3\text{O}_2$  what is the mole ratio of aluminum to oxygen?

- a) 10:6
- b) 3:4
- c) 2:3
- d) 4:3

5. The Haber process for producing ammonia commercially is represented by the equation

$\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$ . To completely convert 9.0 mol hydrogen gas to ammonia gas, how many moles of nitrogen are required.

- a) 1.0 mol
- b) 2.0 mol
- c) 3.0 mol
- d) 6.0 mol

6. In the equation  $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$ , how many moles of oxygen are produced when 3.0 mol of  $\text{KClO}_3$  decompose completely?

- a) 1.0 Mol
- b) 2.5 Mol
- c) 3.0 Mol
- d) 4.5 Mol

7. For the reaction  $\text{C} + 2\text{H}_2 \rightarrow \text{CH}_4$ , how many moles of hydrogen are required to produce 10 mol of methane,  $\text{CH}_4$ ?

- a) 2 mol
- b) 4 mol
- c) 10 mol
- d) 20 mol

8. For the reaction  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ , how many grams of water are produced from 6.00 mol of hydrogen?

- a) 2.00 g
- b) 6.00 g
- c) 54.0 g
- d) 108 g

9. For the reaction  $\text{SO}_3 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4$ , how many grams of sulfur trioxide are required to produce 4.00 mol of sulfuric acid?

- a) 80.0 g
- b) 160. g
- c) 240. g
- d) 320. g

10. For the reaction  $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$ , how many moles of carbon dioxide are produced from the combustion of 100. g of methane?

- a) 6.23 mol
- b) 1.08 mol
- c) 12.5 mol
- d) 25 mol

11. For the reaction  $\text{Cl}_2 + 2\text{KBr} \rightarrow 2\text{KCl} + \text{Br}_2$ , how many moles of potassium chloride are produced from 119 g of potassium bromide?

- a) 0.119 mol
- b) 0.236 mol
- c) 0.581 mol
- d) 1.00 mol

12. For the reaction  $2\text{KIO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$ , how many moles of potassium chlorate are required to produce 250 g of oxygen?

- a) 4.3 mol
- b) 4.9 mol
- c) 5.2 mol

13. Which reactant controls the amount of product formed in a chemical reaction?

- a) excess reactant
- b) mole ratio
- c) composition reactant
- d) limiting reactant

14. To determine the limiting reactant in a chemical reaction involving the combination of known masses of A and B, one should first calculate

- a) the mass of 100 mol of A and B
- b) the masses of all products
- c) the bond energies of A and B
- d) the number of moles of B and the number of moles of A available.

15. What is the measured amount of a product obtained from a chemical reaction?

- a) mole ratio
- b) percent yield
- c) theoretical yield
- d) actual yield

16. In most chemical reactions the amount of product obtained is

- a) equal to the theoretical yield.
- b) less than the theoretical yield.
- c) more than the theoretical yield.
- d) more than the percent yield.

17. What is the maximum possible amount of product expected in a chemical reaction?

- a) theoretical yield
- b) percent yield
- c) mole ratio
- d) actual yield

18. For the reaction  $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$ , calculate the percent yield if 200. g of chlorine react with excess sodium to produce 240. g of sodium chloride.

- a) 61.2%
- b) 72.8%
- c) 83.4%
- d) 88.4%

Answers: