1. The equation  $N_2 + 3H_2 \rightarrow 2NH_3$  means that 1 g of  $N_2$  reacts with 3 g of  $H_2$  to form 2 g of  $NH_3$ .

[A] True

[B] False

2. Balance the following equation for the reaction where hydrogen sulfide gas burns in oxygen gas to form gaseous water and sulfur dioxide gas.  $H_2S(g) + O_2(g) \rightarrow SO_2(g) + H_2O(g)$ 

- 1. Which equation shows a conservation of mass? (1) Na + Cl<sub>2</sub>  $\rightarrow$  NaCl (3) H<sub>2</sub>O  $\rightarrow$  H<sub>2</sub> + O<sub>2</sub> (2) Al + Br<sub>2</sub>  $\rightarrow$  AlBr<sub>3</sub> (4) PCl<sub>5</sub>  $\rightarrow$  PCl<sub>3</sub> + Cl<sub>2</sub>
- 2. When the equation

$$\_NH_3 + \_O_2 \rightarrow \_HNO_3 + \_H_2O$$

is completely balanced using smallest whole numbers, the coefficient of O<sub>2</sub> would be

(1) 1	(3) 3
(2) 2	(4) 4

3. When the equation

$$\underline{\text{Ca(ClO}_3)_2} \rightarrow \underline{\text{CaCl}_2} + \underline{\text{O}_2}$$

is correctly balanced, the coefficient in front of the  $O_2$  will be

(1) 1	(3) 3
(2) 2	(4) 4

4. When the equation

$$\frac{\text{Fe}_2\text{O}_3(s)}{_2(g)}^{} + \text{CO}(g) \rightarrow \text{Fe}(l) + \text{CO}$$

is correctly balanced using the smallest whole numbers, the coefficient of Fe(l) is

(1) 1	(3) 3
(2) 2	(4) 4

5. When the equation

$$\underline{C_2H_6} + \underline{O_2} \rightarrow \underline{CO_2} + \underline{H_2O}$$

is correctly balanced, the coefficient in front of  $O_2$  will be

(1) 7 (3	3) 3 -
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(2) 10 (4) 4

6. When the equation

$$\_Cu_2S + \_O_2 \rightarrow \_Cu_2O + \_SO_2$$

is completely balanced using smallest whole numbers the coefficient of the  $O_2$  would be

- (1) 5 (3) 3 (2) 2 (4) 4
- 7. Which equation is correctly balanced?
  (1) CaO + 2H<sub>2</sub>O → Ca(OH)<sub>2</sub>
  (2) NH<sub>3</sub> + 2O<sub>2</sub> → HNO<sub>3</sub> + H<sub>2</sub>O
  (3) Ca(OH)<sub>2</sub> + 2H<sub>3</sub>PO<sub>4</sub> → Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> + 3H<sub>2</sub>O

(4) Cu + 
$$H_2SO_4 \rightarrow CuSO_4 + H_2O + SO_2$$

8. 
$$\operatorname{Ba(NO_3)_2(aq) + Na_2SO_4(aq) \rightarrow}_{2 \operatorname{NaNO_3(aq) + BaSO_4(s)}}$$

What type of reaction is shown above?

(1) synthesis	(3) single replacement
(2) decomposition	(4) double replacement

9.  $N_2(g) + 3 H_2(g) \leftrightarrow 2 NH_3(g)$ 

What type of reaction is shown above?

(1) synthesis	(3) single replacement
(2) decomposition	(4) double replacement

10. 
$$2 \operatorname{SO}_3(g) \leftrightarrow 2 \operatorname{SO}_2(g) + \operatorname{O}_2(g)$$

What type of reaction is shown above?

(1) synthesis(2) decomposition(3) single replacement(4) double replacement

11. 
$$Mg(s) + 2 HCl(aq) \leftrightarrow MgCl_2(aq) + H_2(g)$$

What type of reaction is shown above?

(1) synthesis	(3) single replacement
(2) decomposition	(4) double replacement

12. 2 
$$NH_3(g) \leftrightarrow N_2(g) + 3 H_2(g)$$

What type of reaction is shown above?

- (1) synthesis (3) single replacement
- (2) decomposition (4) double replacement

13. Which equation represents a double replacement reaction?

 $\begin{array}{l} (1) \ 2 \ \mathrm{Na} + 2 \ \mathrm{H_2O} \rightarrow 2 \ \mathrm{NaOH} + \mathrm{H_2} \\ (2) \ \mathrm{CaCO_3} \rightarrow \mathrm{CaO} + \mathrm{CO_2} \\ (3) \ \mathrm{LiOH} + \mathrm{HCl} \rightarrow \mathrm{LiCl} + \mathrm{H_2O} \\ (4) \ \mathrm{CH_4} + 2 \ \mathrm{O_2} \rightarrow \mathrm{CO_2} + 2 \ \mathrm{H_2O} \end{array}$ 

- 1. \_\_\_\_\_
- 2. \_\_\_\_
- 3. \_\_\_\_
- 4. \_\_\_\_
- 5. \_\_\_\_
- 6. \_\_\_\_\_
- 7. \_\_\_\_
- 8. \_\_\_\_
- 9. \_\_\_\_
- 10. \_\_\_\_
- 11. \_\_\_\_\_
- 12. \_\_\_\_
- 13. \_\_\_\_

Give the symbol (or symbols) that necessary to indicate each of the following in a chemical reaction:

- 16. solid
- 17. liquid
- 18. gas
- 19. dissolved in water
- 20. "yields" (makes)
- 21. "yields in a reversible reaction"22. "substance "X" is used as a catalyst when A yields B and C
- 23. List the diatomic elements:
- 24. In number 22, indicate the reactant(s) and the product(s)