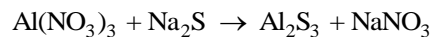


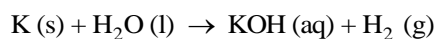
CHEM 110: Chapter 3 Practice Test Questions**Multiple Choice**

1) When the following equation is balanced, the coefficients are _____.



- A) 2, 3, 1, 6
- B) 2, 1, 3, 2
- C) 1, 1, 1, 1
- D) 4, 6, 3, 2
- E) 2, 3, 2, 3

2) When the following equation is balanced, the coefficient of H_2 is _____.



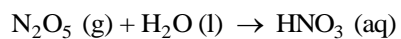
- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

3) When the following equation is balanced, the coefficient of HCl is _____.



- A) 1
- B) 2
- C) 3
- D) 4
- E) 0

4) When the following equation is balanced, the coefficient of dinitrogen pentoxide is _____.



- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

5) Write the balanced equation for the reaction that occurs when methanol, $\text{CH}_3\text{OH}_{(l)}$ is burned in air. What is the coefficient of methanol in the balanced equation?

- A) 1
- B) 2
- C) 3
- D) 4
- E) 3/2

6) The balanced equation for the decomposition of sodium azide is _____.

- A) $2\text{NaN}_3(\text{s}) \rightarrow 2\text{Na}(\text{s}) + 3\text{N}_2(\text{g})$
- B) $2\text{NaN}_3(\text{s}) \rightarrow \text{Na}_2(\text{s}) + 3\text{N}_2(\text{g})$
- C) $\text{NaN}_3(\text{s}) \rightarrow \text{Na}(\text{s}) + \text{N}_2(\text{g})$
- D) $\text{NaN}_3(\text{s}) \rightarrow \text{Na}(\text{s}) + \text{N}_2(\text{g}) + \text{N}(\text{g})$
- E) $2\text{NaN}_3(\text{s}) \rightarrow 2\text{Na}(\text{s}) + 2\text{N}_2(\text{g})$

7) There are _____ hydrogen atoms in 25 molecules of $\text{C}_4\text{H}_4\text{S}_2$.

- A) 25
- B) 3.8×10^{24}
- C) 6.0×10^{25}
- D) 100
- E) 1.5×10^{25}

8) A 2.25-g sample of magnesium nitrate, $\text{Mg}(\text{NO}_3)_2$, contains _____ mol of this compound.

- A) 38.4
- B) 65.8
- C) 148.3
- D) 0.0261
- E) 0.0152

9) What is the empirical formula of a compound that contains 29% Na, 41% S, and 30% O by mass?

- A) $\text{Na}_2\text{S}_2\text{O}_3$
- B) NaSO_2
- C) NaSO
- D) NaSO_3
- E) $\text{Na}_2\text{S}_2\text{O}_6$

10) A compound that is composed of carbon, hydrogen, and oxygen contains 70.6% C, 5.9% H, and 23.5% O by mass. The molecular weight of the compound is 136 amu. What is the molecular formula?

- A) $\text{C}_8\text{H}_8\text{O}_2$
- B) $\text{C}_8\text{H}_4\text{O}$
- C) $\text{C}_4\text{H}_4\text{O}$
- D) $\text{C}_9\text{H}_{12}\text{O}$
- E) $\text{C}_5\text{H}_6\text{O}_2$

11) A compound that is composed of only carbon and hydrogen contains 80.0% C and 20.0% H by mass. What is the empirical formula of the compound?

- A) $C_{20}H_{60}$
- B) C_7H_{20}
- C) CH_3
- D) C_2H_6
- E) CH_4

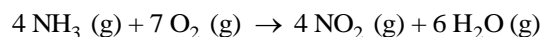
12) A compound is composed of only C, H, and O. The combustion of a 0.519-g sample of the compound yields 1.24 g of CO_2 and 0.255 g of H_2O . What is the empirical formula of the compound?

- A) C_6H_6O
- B) C_3H_3O
- C) CH_3O
- D) $C_2H_6O_5$
- E) $C_2H_6O_2$

13) Combustion of a 0.9835-g sample of a compound containing only carbon, hydrogen, and oxygen produced 1.900 g of CO_2 and 1.070 g of H_2O . What is the empirical formula of the compound?

- A) C_2H_5O
- B) $C_4H_{10}O_2$
- C) $C_4H_{11}O_2$
- D) $C_4H_{10}O$
- E) $C_2H_5O_2$

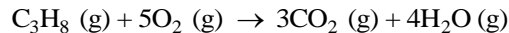
14) The combustion of ammonia in the presence of excess oxygen yields NO_2 and H_2O :



The combustion of 28.8 g of ammonia consumes _____ g of oxygen.

- A) 94.9
- B) 54.1
- C) 108
- D) 15.3
- E) 28.8

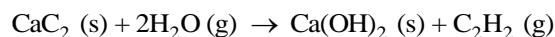
15) The combustion of propane (C_3H_8) produces CO_2 and H_2O :



The reaction of 2.5 mol of O_2 will produce _____ mol of H_2O .

- A) 4.0
- B) 3.0
- C) 2.5
- D) 2.0
- E) 1.0

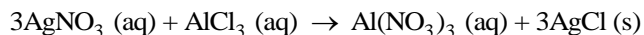
16) Calcium carbide (CaC_2) reacts with water to produce acetylene (C_2H_2) :



Production of 13g of C_2H_2 requires consumption of _____ g of H_2O .

- A) 4.5
- B) 9.0
- C) 18
- D) 4.8×10^2
- E) 4.8×10^{-2}

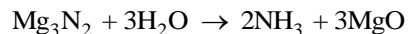
17) Silver nitrate and aluminum chloride react with each other by exchanging anions:



What mass in grams of $AgCl$ is produced when 4.22 g of $AgNO_3$ react with 7.73 g of $AlCl_3$?

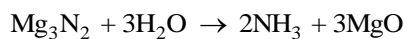
- A) 17.6
- B) 4.22
- C) 24.9
- D) 3.56
- E) 11.9

18) How many moles of magnesium oxide are produced by the reaction of 3.82 g of magnesium nitride with 7.73 g of water?



- A) 0.113
- B) 0.0378
- C) 0.429
- D) 0.0756
- E) 4.57

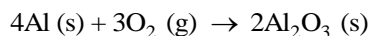
19) A 3.82-g sample of magnesium nitride is reacted with 7.73 g of water.



The yield of MgO is 3.60 g. What is the percent yield in the reaction?

- A) 94.5
- B) 78.8
- C) 46.6
- D) 49.4
- E) 99.9

20) Solid aluminum and gaseous oxygen react in a combination reaction to produce aluminum oxide:



In a particular experiment, the reaction of 2.5 g of Al with 2.5 g of O_2 produced 3.5 g of Al_2O_3 . The % yield of the reaction is _____.

- A) 74
- B) 37
- C) 47
- D) 66
- E) 26

21) Sulfur and fluorine react in a combination reaction to produce sulfur hexafluoride:



In a particular experiment, the percent yield is 79.0%. This means that a 7.90-g sample of fluorine yields _____ g of SF_6 in the presence of excess sulfur.

- A) 30.3
- B) 10.1
- C) 7.99
- D) 24.0
- E) 0.110