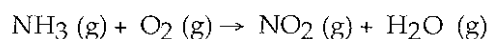


Name _____

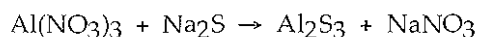
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

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



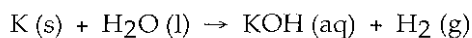
- A) 4, 7, 4, 6 B) 1, 3, 1, 2 C) 4, 3, 4, 3 D) 2, 3, 2, 3 E) 1, 1, 1, 1

2) When the following equation is balanced, the coefficients are _____ 2) _____



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

3) When the following equation is balanced, the coefficient of H_2 is _____ 3) _____



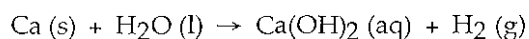
- A) 4 B) 5 C) 1 D) 2 E) 3

4) When the following equation is balanced, the coefficient of Al is _____ 4) _____



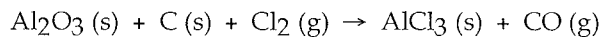
- A) 1 B) 5 C) 2 D) 3 E) 4

5) When the following equation is balanced, the coefficient of H_2O is _____ 5) _____



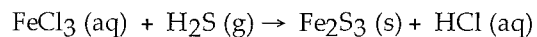
- A) 4 B) 2 C) 1 D) 5 E) 3

6) When the following equation is balanced, the coefficient of Al_2O_3 is _____. 6) _____



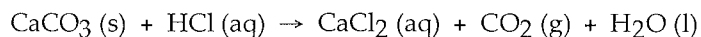
- A) 2 B) 5 C) 3 D) 4 E) 1

7) When the following equation is balanced, the coefficient of H_2S is _____. 7) _____



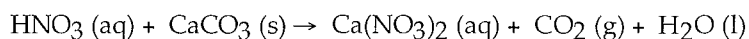
- A) 1 B) 2 C) 4 D) 3 E) 5

8) When the following equation is balanced, the coefficient of HCl is _____. 8) _____



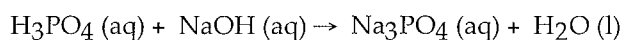
- A) 3 B) 1 C) 0 D) 4 E) 2

9) When the following equation is balanced, the coefficient of HNO_3 is _____. 9) _____



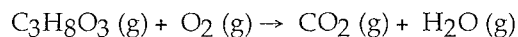
- A) 1 B) 4 C) 3 D) 5 E) 2

10) When the following equation is balanced, the coefficient of H_3PO_4 is _____. 10) _____



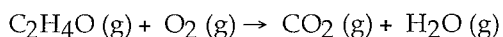
- A) 1 B) 0 C) 2 D) 3 E) 4

11) When the following equation is balanced, the coefficient of $\text{C}_3\text{H}_8\text{O}_3$ is _____. 11) _____



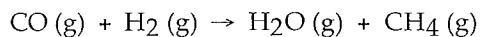
- A) 3 B) 5 C) 7 D) 2 E) 1

12) When the following equation is balanced, the coefficient of O_2 is _____. 12) _____



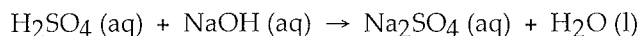
- A) 5 B) 3 C) 2 D) 1 E) 4

13) When the following equation is balanced, the coefficient of H₂ is _____. 13) _____



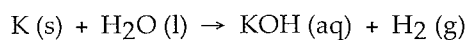
- A) 2 B) 4 C) 3 D) 1 E) 0

14) When the following equation is balanced, the coefficient of H₂SO₄ is _____. 14) _____



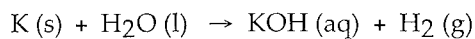
- A) 3 B) 4 C) 2 D) 0.5 E) 1

15) When the following equation is balanced, the coefficient of water is _____. 15) _____



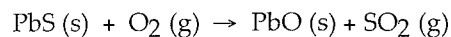
- A) 4 B) 1 C) 3 D) 5 E) 2

16) When the following equation is balanced, the coefficient of hydrogen is _____. 16) _____



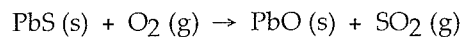
- A) 4 B) 3 C) 2 D) 1 E) 5

17) When the following equation is balanced, the coefficient of oxygen is _____. 17) _____



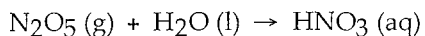
- A) 3 B) 5 C) 4 D) 1 E) 2

18) When the following equation is balanced, the coefficient of sulfur dioxide is _____. 18) _____



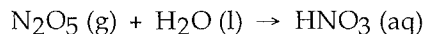
- A) 4 B) 5 C) 1 D) 2 E) 3

19) When the following equation is balanced, the coefficient of dinitrogen pentoxide is _____. 19) _____



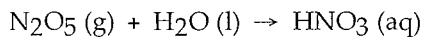
- A) 4 B) 2 C) 5 D) 1 E) 3

20) When the following equation is balanced, the coefficient of water is _____. 20) _____



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

21) When the following equation is balanced, the coefficient of nitric acid is _____. 21) _____



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

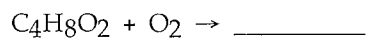
22) Write the balanced equation for the reaction that occurs when methanol, $\text{CH}_3\text{OH} (\text{l})$, is burned in air. What is the coefficient of methanol in the balanced equation? 22) _____

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

23) Write the balanced equation for the reaction that occurs when methanol, $\text{CH}_3\text{OH} (\text{l})$, is burned in air. What is the coefficient of oxygen in the balanced equation? 23) _____

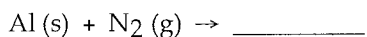
- A) 1 B) 2 C) 3 D) 4 E) 3/2

24) What is the coefficient of O_2 when the following equation is completed and balanced? 24) _____



- A) 3 B) 1 C) 5 D) 2 E) 6

25) Predict the product in the combination reaction below. 25) _____



- A) AlN B) Al_3N C) AlN_3 D) Al_3N_2 E) AlN_2

26) The balanced equation for the decomposition of sodium azide is _____. 26) _____

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

- 27) There are _____ mol of carbon atoms in 4 mol of dimethylsulfoxide (C_2H_6SO). 27) _____
A) 3 B) 6 C) 2 D) 8 E) 4
- 28) There are _____ sulfur atoms in 25 molecules of $C_4H_4S_2$. 28) _____
A) 4.8×10^{25}
B) 1.5×10^{25}
C) 3.0×10^{25}
D) 6.02×10^{23}
E) 50
- 29) There are _____ hydrogen atoms in 25 molecules of $C_4H_4S_2$. 29) _____
A) 3.8×10^{24} B) 25 C) 6.0×10^{25} D) 1.5×10^{25} E) 100
- 30) A sample of C_3H_8O that contains 200 molecules contains _____ carbon atoms. 30) _____
A) 3.61×10^{26}
B) 600
C) 4.01×10^{25}
D) 200
E) 1.20×10^{26}
- 31) How many grams of hydrogen are in 46 g of CH_4O ? 31) _____
A) 1.5 B) 2.8 C) 184 D) 5.8 E) 0.36
- 32) How many grams of oxygen are in 65 g of $C_2H_2O_2$? 32) _____
A) 29 B) 9.0 C) 36 D) 18 E) 130
- 33) How many moles of carbon dioxide are there in 52.06 g of carbon dioxide? 33) _____
A) 6.022×10^{23}
B) 3.134×10^{25}
C) 8.648×10^{23}
D) 1.183
E) 0.8452

TEST MATERIAL ENDS HERE

- 34) There are _____ molecules of methane in 0.123 mol of methane (CH₄). 34) _____
- A) 2.46×10^{-2}
 B) 2.04×10^{-25}
 C) 0.615
 D) 7.40×10^{22}
 E) 5
- 35) A 2.25-g sample of magnesium nitrate, Mg(NO₃)₂, contains _____ mol of this compound. 35) _____
- A) 0.0152 B) 38.4 C) 148.3 D) 0.0261 E) 65.8
- 36) A 22.5-g sample of ammonium carbonate contains _____ mol of ammonium ions. 36) _____
- A) 3.47 B) 0.234 C) 2.14 D) 0.288 E) 0.468
- 37) What is the empirical formula of a compound that contains 27.0% S, 13.4% O, and 59.6% Cl by mass? 37) _____
- A) SOCl B) SO₂Cl C) SOCl₂ D) ClSO₄ E) S₂OCl
- 38) What is the empirical formula of a compound that contains 29% Na, 41% S, and 30% O by mass? 38) _____
- A) Na₂S₂O₆ B) Na₂S₂O₃ C) NaSO₂ D) NaSO E) NaSO₃
- 39) What is the empirical formula of a compound that contains 49.4% K, 20.3% S, and 30.3% O by mass? 39) _____
- A) K₂SO₃ B) K₂SO₄ C) KSO₃ D) KSO₄ E) KSO₂
- 40) A compound contains 40.0% C, 6.71% H, and 53.29% O by mass. The molecular weight of the compound is 60.05 amu. The molecular formula of this compound is _____. 40) _____
- A) C₂H₃O₄ B) CH₂O C) CHO₂ D) C₂H₂O₄ E) C₂H₄O₂
- 41) 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? 41) _____
- A) C₅H₆O₂ B) C₈H₄O C) C₉H₁₂O D) C₈H₈O₂ E) C₄H₄O
- 42) A compound that is composed of only carbon and hydrogen contains 85.7% C and 14.3% H by mass. What is the empirical formula of the compound? 42) _____
- A) C₂H₄ B) CH₄ C) C₄H₈ D) CH₂ E) C₈H₁₄

43) 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? 43) _____
A) C₂₀H₆₀ B) CH₃ C) C₇H₂₀ D) CH₄ E) C₂H₆

44) A compound contains 38.7% K, 13.9% N, and 47.4% O by mass. What is the empirical formula of the compound? 44) _____
A) K₄NO₅ B) KNO₃ C) KNO₂ D) K₂NO₃ E) K₂N₂O₃

45) 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 CO₂ and 0.255 g of H₂O. What is the empirical formula of the compound? 45) _____
A) C₆H₆O B) C₃H₃O C) CH₃O D) C₂H₆O₂ E) C₂H₆O₅

46) Combustion of a 1.031-g sample of a compound containing only carbon, hydrogen, and oxygen produced 2.265 g of CO₂ and 1.236 g of H₂O. What is the empirical formula of the compound? 46) _____
A) C₃H₅O B) C₆H₁₆O₂ C) C₃H₉O₃ D) C₃H₆O₃ E) C₃H₈O

47) Combustion of a 0.9835-g sample of a compound containing only carbon, hydrogen, and oxygen produced 1.900 g of CO₂ and 1.070 g of H₂O. What is the empirical formula of the compound? 47) _____
A) C₄H₁₀O B) C₂H₅O₂ C) C₄H₁₀O₂ D) C₄H₁₁O₂ E) C₂H₅O

48) Magnesium and nitrogen react in a combination reaction to produce magnesium nitride: 48) _____
$$3 \text{ Mg} + \text{ N}_2 \rightarrow \text{ Mg}_3\text{ N}_2$$

In a particular experiment, a 9.27-g sample of N₂ reacts completely. The mass of Mg consumed is _____ g.

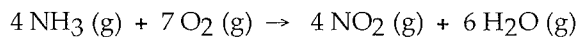
A) 13.9 B) 24.1 C) 0.92 D) 16.1 E) 8.04

49) The combustion of ammonia in the presence of excess oxygen yields NO₂ and H₂O: 49) _____
$$4 \text{ NH}_3 (\text{ g}) + 7 \text{ O}_2 (\text{ g}) \rightarrow 4 \text{ NO}_2 (\text{ g}) + 6 \text{ H}_2\text{O} (\text{ g})$$

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

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

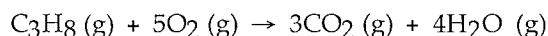
50) The combustion of ammonia in the presence of excess oxygen yields NO₂ and H₂O: 50) _____



The combustion of 43.9 g of ammonia produces _____ g of NO₂.

- A) 43.9 B) 2.58 C) 178 D) 119 E) 0.954

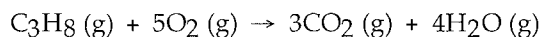
51) The combustion of propane (C₃H₈) produces CO₂ and H₂O: 51) _____



The reaction of 2.5 mol of O₂ will produce _____ mol of H₂O.

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

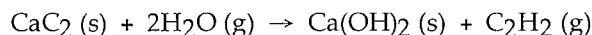
52) The combustion of propane (C₃H₈) in the presence of excess oxygen yields CO₂ and H₂O: 52) _____



When 2.5 mol of O₂ are consumed in their reaction, _____ mol of CO₂ are produced.

- A) 3.0 B) 5.0 C) 1.5 D) 2.5 E) 6.0

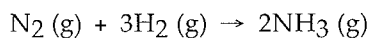
53) Calcium carbide (CaC₂) reacts with water to produce acetylene (C₂H₂): 53) _____



Production of 13g of C₂H₂ requires consumption of _____ g of H₂O.

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

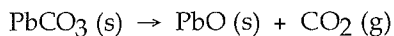
54) Under appropriate conditions, nitrogen and hydrogen undergo a combination reaction to yield ammonia: 54) _____



A 7.1-g sample of N₂ requires _____ g of H₂ for complete reaction.

- A) 0.76 B) 1.2 C) 0.51 D) 1.5 E) 17.2

55) Lead (II) carbonate decomposes to give lead (II) oxide and carbon dioxide: 55) _____



How many grams of lead (II) oxide will be produced by the decomposition of 2.50 g of lead (II) carbonate?

- A) 2.61 B) 2.50 C) 0.41 D) 2.09 E) 0.00936

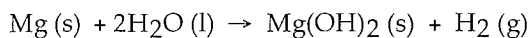
56) GeF_3H is formed from GeH_4 and GeF_4 in the combination reaction: 56) _____



If the reaction yield is 92.6%, how many moles of GeF_4 are needed to produce 8.00 mol of GeF_3H ?

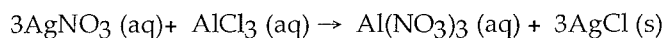
- A) 2.16 B) 5.56 C) 3.24 D) 6.48 E) 2.78

57) What mass in grams of hydrogen is produced by the reaction of 4.73 g of magnesium with 1.83 g of water? 57) _____



- A) 0.219 B) 0.0162 C) 0.102 D) 0.0485 E) 0.204

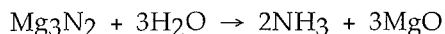
58) Silver nitrate and aluminum chloride react with each other by exchanging anions: 58) _____



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

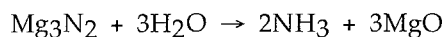
- A) 3.56 B) 4.22 C) 17.6 D) 11.9 E) 24.9

59) How many moles of magnesium oxide are produced by the reaction of 3.82 g of magnesium nitride with 7.73 g of water? 59) _____



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

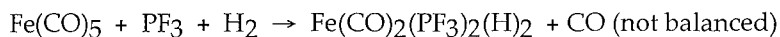
60) A 3.82-g sample of magnesium nitride is reacted with 7.73 g of water. 60) _____



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

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

61) Pentacarbonyliron (Fe(CO)_5) reacts with phosphorous trifluoride (PF_3) and hydrogen, releasing carbon monoxide: 61) _____



The reaction of 5.0 mol of Fe(CO)_5 , 8.0 mol of PF_3 and 6.0 mol of H_2 will release _____ mol of CO .

- A) 6.0 B) 5.0 C) 15 D) 24 E) 12

- 62) What is the maximum mass in grams of NH_3 that can be produced by the reaction of 1.0 g of N_2 with 3.0 g of H_2 via the equation below? 62) _____



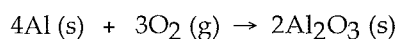
- A) 1.2 B) 17 C) 0.61 D) 4.0 E) 2.0

- 63) What is the maximum amount in grams of SO_3 that can be produced by the reaction of 1.0 g of S with 1.0 g of O_2 via the equation below? 63) _____



- A) 2.5 B) 1.7 C) 2.0 D) 0.27 E) 3.8

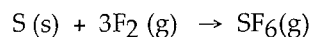
- 64) Solid aluminum and gaseous oxygen react in a combination reaction to produce aluminum oxide: 64) _____



The maximum amount of Al_2O_3 that can be produced from 2.5 g of Al and 2.5 g of O_2 is _____ g.

- A) 5.3 B) 9.4 C) 4.7 D) 5.0 E) 7.4

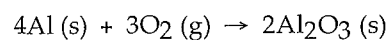
- 65) Sulfur and fluorine react in a combination reaction to produce sulfur hexafluoride: 65) _____



The maximum amount of SF_6 that can be produced from the reaction of 3.5 g of sulfur with 4.5 g of fluorine is _____ g.

- A) 12 B) 5.8 C) 8.0 D) 16 E) 3.2

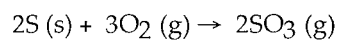
- 66) Solid aluminum and gaseous oxygen react in a combination reaction to produce aluminum oxide: 66) _____



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

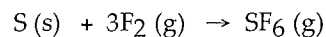
- 67) Sulfur and oxygen react in a combination reaction to produce sulfur trioxide, an environmental pollutant: 67) _____



In a particular experiment, the reaction of 1.0 g S with 1.0 g O₂ produced 0.80 g of SO₃. The % yield in this experiment is _____.

- A) 30 B) 88 C) 48 D) 29 E) 21

- 68) Sulfur and fluorine react in a combination reaction to produce sulfur hexafluoride: 68) _____



In a particular experiment, the percent yield is 79.0%. This means that a 7.90-g sample of fluorine yields _____ g of SF₆ in the presence of excess sulfur.

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

Answer Key

Testname: SAMPLE QUESTIONS CHAPTER 3

- 1) A
- 2) E
- 3) C
- 4) C
- 5) B
- 6) E
- 7) D
- 8) E
- 9) E
- 10) A
- 11) D
- 12) A
- 13) C
- 14) E
- 15) E
- 16) D
- 17) A
- 18) D
- 19) D
- 20) B
- 21) A
- 22) B
- 23) C
- 24) C
- 25) A
- 26) E
- 27) D
- 28) E
- 29) E
- 30) B
- 31) D
- 32) C
- 33) D
- 34) D
- 35) A
- 36) E
- 37) C
- 38) B
- 39) A
- 40) E
- 41) D
- 42) D
- 43) B
- 44) B
- 45) B
- 46) E
- 47) D
- 48) B
- 49) C
- 50) D

Answer Key

Testname: SAMPLE QUESTIONS CHAPTER 3

- 51) D
- 52) C
- 53) E
- 54) D
- 55) D
- 56) D
- 57) C
- 58) A
- 59) A
- 60) D
- 61) E
- 62) A
- 63) B
- 64) C
- 65) B
- 66) B
- 67) C
- 68) C