

Chapter 11 Practice Test

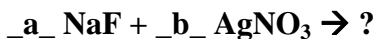
Multiple Choice

Identify the choice that best completes the statement or answers the question.

*You will need your own calculator for blast from the past questions.

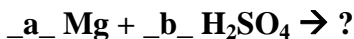
- _____ 1. Some of the molecules found in the human body are NHCHCOOH (glycine), CHO(glucose), and CH₃(CH₂)₁₆COOH (stearic acid). The bonds they form are
- | | |
|-------------|-------------|
| a. covalent | c. metallic |
| b. ionic | d. nuclear |
- _____ 2. H₂O₂, hydrogen peroxide, naturally breaks down into HO₂ and O₂ over time. MnO₂, manganese dioxide, can be used to lower the energy of activation needed for this reaction to take place and, thus, increase the rate of reaction. What type of substance is MnO₂ ?
- | | |
|-----------------|---------------|
| a. an inhibitor | c. a product |
| b. a catalyst | d. a reactant |
- _____ 3.
$$\text{C}_3\text{H}_8 + \text{O}_2 \longrightarrow \text{CO}_2 + \text{H}_2\text{O}$$
- This chemical equation represents the combustion of propane. When correctly balanced, the coefficient for water is
- | | |
|------|-------|
| a. 2 | c. 8 |
| b. 4 | d. 16 |
- _____ 4. Which of the following is a balanced equation for the combustion of ethanol (CH₃CH₂OH)?
- | | |
|--|--|
| a. CH ₃ CH ₂ OH + 3O ₂ → CO ₂ + 2H ₂ O | c. CH ₃ CH ₂ OH + O ₂ → 2CO ₂ + 3H ₂ O |
| b. CH ₃ CH ₂ OH + 3O ₂ → 2CO ₂ + 3H ₂ O | d. CH ₃ CH ₂ OH + 3O ₂ → 2CO ₂ + 2H ₂ O |
- _____ 5.
$$\text{Mg}_3\text{N}_2(\text{s}) + 6\text{H}_2\text{O}(\text{l}) \longrightarrow$$
- $$2\text{NH}_3(\text{aq}) + 3\text{Mg}(\text{OH})_2(\text{s})$$
- Classify the following reaction.
- | | |
|-----------------------|-----------------------|
| a. combination | c. single replacement |
| b. double replacement | d. combustion |
- _____ 6. What type of reaction is the reaction below?
- a Fe₂O₃ → b Fe + c O₂
- | | |
|--------------------------|-----------------------|
| a. Synthesis/Combination | c. Combustion |
| b. Decomposition | d. Single Replacement |
- _____ 7. What type of reaction is the reaction below?
- a Al + b CuSO₄ → c Al₂(SO₄)₃ + d Cu
- | | |
|--------------------------|-----------------------|
| a. Synthesis/Combination | c. Double Replacement |
| b. Decomposition | d. Single Replacement |

___ 8. What type of reaction is the reaction below?



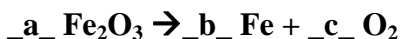
- | | |
|-----------------------|--------------------------|
| a. Double Replacement | c. Synthesis/Combination |
| b. Decomposition | d. Single Replacement |

___ 9. What type of reaction is the reaction below?



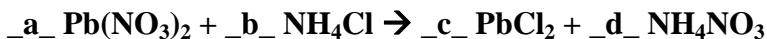
- | | |
|-----------------------|--------------------------|
| a. Double Replacement | c. Synthesis/Combination |
| b. Decomposition | d. Single Replacement |

___ 10. Select the set of coefficients that properly balance the equation below.



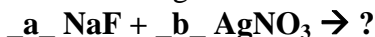
- | | |
|------------|------------|
| a. 2, 4, 3 | c. 1, 2, 3 |
| b. 2, 2, 3 | d. 3, 4, 4 |

___ 11. Select the set of coefficients that properly balance the equation below.



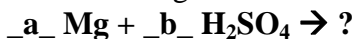
- | | |
|---------------|---------------|
| a. 1, 2, 1, 2 | c. 2, 1, 2, 1 |
| b. 1, 2, 2, 1 | d. 1, 2, 2, 2 |

___ 12. The following reactants would produce what type of reaction?



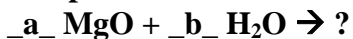
- | | |
|-----------------------|----------------|
| a. double replacement | c. combustion |
| b. single replacement | d. combination |

___ 13. The following reactants would produce what type of reaction?



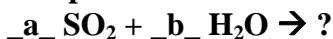
- | | |
|-----------------------|------------------|
| a. double replacement | c. combustion |
| b. single replacement | d. decomposition |

___ 14. The products created from the reactants below would be:



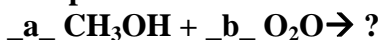
- | | |
|---------|---------|
| a. acid | b. base |
|---------|---------|

___ 15. The products created from the reactants below would be:



- | | |
|---------|---------|
| a. acid | b. base |
|---------|---------|

___ 16. The products created from the reactants below would be:



- | | |
|---------------------------------------|-------------------------------------|
| a. CO ₂ + OH | c. CO ₂ |
| b. CO ₂ + H ₂ O | d. CO ₂ + H ₂ |

___ 17. An acid and base form what products?

- | | |
|----------|------------------------|
| a. water | c. water + salt |
| b. salt | d. hydrogen gas + salt |

___ 18. The correct balanced equation for the reaction below is:



- | | |
|------------|------------|
| a. 2,2,2,1 | c. 2,1,1,1 |
| b. 2,2,1,1 | d. 2,1,1,2 |

___ 19. Chlorine Gas is bubbled through a solution of calcium bromide at room temperature and produces bromine gas and calcium chloride. Choose all the correct product(s) for the reaction.

- | | |
|----------------------------------|--------------------------------|
| a. Br_2 | c. BrCl |
| b. $\text{Br}_2 + \text{CaCl}_2$ | d. $\text{CaCl}_2 + \text{Br}$ |

___ 20. A flaming splint of wood is extinguished by what gas?

- | | |
|-------------------|-------------|
| a. carbon dioxide | c. water |
| b. oxygen | d. hydrogen |

___ 21. A glowing splint of wood ignites from what gas?

- | | |
|-------------------|-------------|
| a. carbon dioxide | c. water |
| b. oxygen | d. hydrogen |

___ 22. Phenolphthalein indicator turns pink from the presence of a:

- | | |
|-----------|----------|
| a. base | c. acid |
| b. oxygen | d. water |

___ 23. $\text{Cu}_{(s)} + \text{O}_{2(g)} \rightarrow \underline{\hspace{1cm}}$.

The following reactants would produce what type of reaction?

- | | |
|-----------------------|-----------------------|
| a. decomposition | c. double replacement |
| b. single replacement | d. combination |

___ 24. Two reactants are combined to produce a salt and water; these are the products of a reaction between:

- | | |
|----------------------------------|------------------------------|
| a. a nonmetallic oxide and water | c. an acid and a base |
| b. a metallic oxide and water | d. a carbohydrate and oxygen |

___ 25. $\underline{\text{a}} \text{ LiOH} + \underline{\text{b}} \text{ H}_3\text{PO}_4 \rightarrow ? + ? + \dots$

This reaction represents a special (exceptional) case of a reaction, which is the:

- | | |
|-------------------------|------------------------------|
| a. formation of an acid | c. acid-base neutralization |
| b. formation of a base | d. formation of hydrogen gas |

___ 26. Hydrogen peroxide breaks down in the presence of manganese dioxide to produce a vapor that is steam and a gas that relights a glowing splint:

- | | |
|---|---|
| a. $\text{H}_2\text{O}_{(l)} + \text{MnO}_{3(g)}$ | c. $\text{H}_2\text{O}_{(l)} + \text{O}_{2(g)}$ |
| b. $\text{H}_2\text{O}_{(g)} + \text{O}_{2(g)}$ | d. $\text{H}_2\text{O}_{(l)} + \text{MnO}_{2(g)}$ |

___ 27. $\underline{\hspace{1cm}} \text{ Al} + \underline{\hspace{1cm}} \text{ CuSO}_4 \rightarrow \text{ Cu} + \text{ Al}_2(\text{SO}_4)_3$

Predict the products and then balance the reactions and choose the correct coefficients.

- | | |
|---------------|---------------|
| a. 4, 3, 2, 6 | c. 2, 3, 1, 3 |
| b. 2, 1, 1, 3 | d. 2, 1, 3, 6 |

___ 28. $\underline{\hspace{1cm}} \text{ Li}_2\text{O} + \underline{\hspace{1cm}} \text{ H}_2\text{O} \rightarrow ?$

The product for this reaction could be classified as a(an)?

- | | |
|---------|---------|
| a. acid | b. base |
|---------|---------|

____ 29. The hydrocarbon C_4H_{10} burns in the air, the correct coefficients for the balanced equation are:
(write the equation first)

- a. 1,7,4,5
- b. 1,4,4,5
- c. 2,13,8,10
- d. 4,26,16,20
- e. already balanced

____ 30. Which of the following is a monatomic gas at STP?

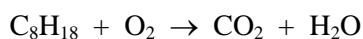
- a. Bromine
- b. Nitrogen
- c. Fluorine
- d. Krypton

____ 31. Which of the following are combustion reactions?

- 1) $CH_4(g) + O_2(g) \rightarrow CO_2(g) + H_2O(l)$
- 2) $CaO(s) + CO_2(g) \rightarrow CaCO_3(s)$
- 3) $PbCO_3(s) \rightarrow PbO(s) + CO_2(g)$
- 4) $CH_3OH(l) + O_2(g) \rightarrow CO_2(g) + H_2O(l)$

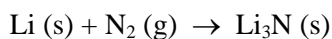
- a. 1 and 4
- b. 1, 2, 3, and 4
- c. 1, 3, and 4
- d. 2, 3, and 4
- e. 3 and 4

____ 32. When the following equation is balanced, the coefficients are _____.



- a. 4, 50, 16, 18
- b. 1, 5, 2, 2
- c. 2, 2, 7, 1
- d. 1, 13, 8, 9
- e. 2, 25, 16, 18

____ 33. Lithium and nitrogen react to produce lithium nitride:



The correct coefficients for this reaction are:

- a. 6,1,2
- b. 1,1,2
- c. 3,2,1
- d. 3,2,2

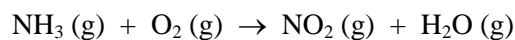
____ 34. Of the reactions below, which one is not a combination reaction?

- a. $C + O_2 \rightarrow CO_2$
- b. $2Mg + O_2 \rightarrow 2MgO$
- c. $2N_2 + 3H_2 \rightarrow 2NH_3$
- d. $CaO + H_2O \rightarrow Ca(OH)_2$
- e. $2CH_4 + 4O_2 \rightarrow 2CO_2 + 4H_2O$

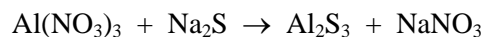
____ 35. When a hydrocarbon burns in air, what component of air reacts?

- a. oxygen
- b. nitrogen
- c. carbon dioxide
- d. water
- e. argon

- _____ 36. Of the reactions below, which one is a decomposition reaction?
- $\text{NH}_4\text{Cl} \rightarrow \text{NH}_3 + \text{HCl}$
 - $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$
 - $2\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$
 - $2\text{CH}_4 + 4\text{O}_2 \rightarrow 2\text{CO}_2 + 4\text{H}_2\text{O}$
 - $\text{Cd}(\text{NO}_3)_2 + \text{Na}_2\text{S} \rightarrow \text{CdS} + 2\text{NaNO}_3$
- _____ 37. Which of the following are combination reactions?
- $\text{CH}_4(\text{g}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$
 - $\text{CaO}(\text{s}) + \text{CO}_2(\text{g}) \rightarrow \text{CaCO}_3(\text{s})$
 - $\text{Mg}(\text{s}) + \text{O}_2(\text{g}) \rightarrow \text{MgO}(\text{s})$
 - $\text{PbCO}_3(\text{s}) \rightarrow \text{PbO}(\text{s}) + \text{CO}_2(\text{g})$
- 1, 2, and 3
 - 2 and 3
 - 1, 2, 3, and 4
 - 4 only
 - 2, 3, and 4
- _____ 38. Which of the following are decomposition reactions?
- $\text{CH}_4(\text{g}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$
 - $\text{CaO}(\text{s}) + \text{CO}_2(\text{g}) \rightarrow \text{CaCO}_3(\text{s})$
 - $\text{Mg}(\text{s}) + \text{O}_2(\text{g}) \rightarrow \text{MgO}(\text{s})$
 - $\text{PbCO}_3(\text{s}) \rightarrow \text{PbO}(\text{s}) + \text{CO}_2(\text{g})$
- 1, 2, and 3
 - 4 only
 - 1, 2, 3, and 4
 - 2 and 3
 - 2, 3, and 4
- _____ 39. When the following equation is balanced, the coefficients are _____.

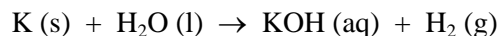


- 1, 1, 1, 1
 - 4, 7, 4, 6
 - 2, 3, 2, 3
 - 1, 3, 1, 2
 - 4, 3, 4, 3
- _____ 40. When the following equation is balanced, the coefficients are _____.



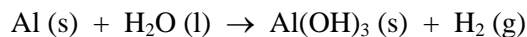
- 2, 3, 1, 6
- 2, 1, 3, 2
- 1, 1, 1, 1
- 4, 6, 3, 2
- 2, 3, 2, 3

___ 41. When the following equation is balanced, the coefficient of H₂ is ___.



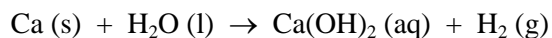
- a. 1
- b. 2
- c. 3
- d. 4
- e. 5

___ 42. When the following equation is balanced, the coefficient of Al is ___.



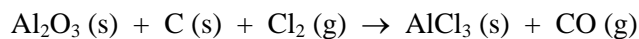
- a. 1
- b. 2
- c. 3
- d. 5
- e. 4

___ 43. When the following equation is balanced, the coefficient of H₂O is ___.



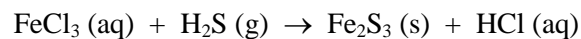
- a. 1
- b. 2
- c. 3
- d. 5
- e. 4

___ 44. When the following equation is balanced, the coefficient of Al₂O₃ is ___.



- a. 1
- b. 2
- c. 3
- d. 4
- e. 5

___ 45. When the following equation is balanced, the coefficient of H₂S is ___.



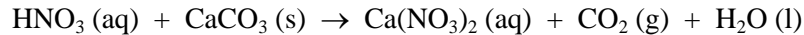
- a. 1
- b. 2
- c. 3
- d. 5
- e. 4

___ 46. When the following equation is balanced, the coefficient of HCl is ___.



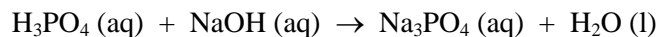
- a. 1
- b. 2
- c. 3
- d. 4
- e. 0

____ 47. When the following equation is balanced, the coefficient of HNO_3 is ____.



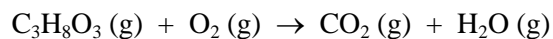
- a. 1
- b. 2
- c. 3
- d. 5
- e. 4

____ 48. When the following equation is balanced, the coefficient of H_3PO_4 is ____.



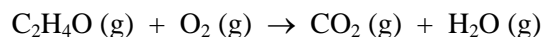
- a. 1
- b. 2
- c. 3
- d. 4
- e. 0

____ 49. When the following equation is balanced, the coefficient of $\text{C}_3\text{H}_8\text{O}_3$ is ____.



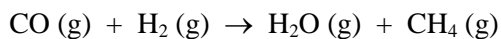
- a. 1
- b. 2
- c. 3
- d. 7
- e. 5

____ 50. When the following equation is balanced, the coefficient of O_2 is ____.



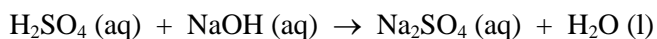
- a. 2
- b. 3
- c. 4
- d. 5
- e. 1

____ 51. Classify the following reaction.



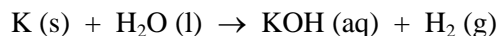
- a. combination
- b. combustion
- c. single replacement
- d. double replacment

____ 52. When the following equation is balanced, the coefficient of H_2SO_4 is ____.



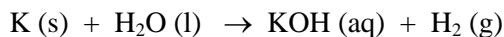
- a. 1
- b. 2
- c. 3
- d. 4

_____ 53. When the following equation is balanced, the coefficient of water is _____.



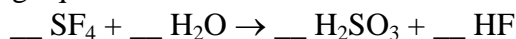
- a. 1
- b. 2
- c. 3
- d. 4
- e. 5

_____ 54. When the following equation is balanced, the coefficient of hydrogen is _____.



- a. 1
- b. 2
- c. 3
- d. 4
- e. 5

_____ 55. Balance the following equation and list the coefficients in order from left to right.



- a. 1, 1, 1, 4
- b. 2, 6, 2, 8
- c. 1, 2, 1, 4
- d. 1, 3, 1, 4

_____ 56. Iron metal reacts with hydrochloric acid to produce iron (II) chloride and hydrogen gas. Identify the balanced reaction that describes this process.

- a. $\text{Fe} + 2 \text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2$
- b. $\text{Fe} + \text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2$
- c. $\text{Fe} + \text{HCl} \rightarrow \text{FeCl} + \text{H}$
- d. $2\text{Fe} + 2\text{HCl} \rightarrow 2\text{FeCl}_2 + \text{H}_2$

_____ 57. In the chemical equation $\text{H}_2\text{O}_2(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{O}_2(\text{g})$, the O_2 is a _____.

- a. catalyst
- b. solid
- c. product
- d. reactant

_____ 58. This symbol (\rightleftharpoons) indicates that _____.

- a. heat must be applied
- b. an incomplete combustion reaction has occurred
- c. a gas is formed by the reaction
- d. the reaction is reversible

_____ 59. In every balanced chemical equation, each side of the equation has the same number of _____.

- a. atoms of each element
- b. molecules
- c. moles
- d. coefficients

_____ 60. When potassium hydroxide and barium chloride react, potassium chloride and barium hydroxide are formed. The balanced equation for this reaction is _____.

- a. $\text{KH} + \text{BaCl} \rightarrow \text{KCl} + \text{BaH}$
- b. $\text{KOH} + \text{BaCl} \rightarrow \text{KCl} + \text{BaOH}$
- c. $2\text{KOH} + \text{BaCl}_2 \rightarrow 2\text{KCl} + \text{Ba}(\text{OH})_2$
- d. $\text{KOH} + \text{BaCl}_2 \rightarrow \text{KCl}_2 + \text{BaOH}$

- _____ 61. Which of the following is the correct skeleton equation for the reaction that takes place when solid phosphorus combines with oxygen gas to form diphosphorus pentoxide?
- a. $P(s) + O_2(g) \rightarrow PO_2(g)$ c. $P(s) + O_2(g) \rightarrow P_2O_5(s)$
b. $P(s) + O(g) \rightarrow P_5O_2(g)$ d. $P_2O_5(s) \rightarrow P_2(s) + O_2(g)$
- _____ 62. When the equation $Fe + Cl_2 \rightarrow FeCl_3$ is balanced, what is the coefficient for Cl_2 ?
- a. 1 c. 3
b. 2 d. 4
- _____ 63. The products of a combustion reaction do NOT include _____.
a. water c. carbon monoxide
b. carbon dioxide d. hydrogen
- _____ 64. The equation $Mg(s) + 2HCl(aq) \rightarrow MgCl_2(aq) + H_2(g)$ is an example of which type of reaction?
a. combination reaction c. decomposition reaction
b. single-replacement reaction d. double-replacement reaction
- _____ 65. A solution of zinc sulfide (assume that zinc sulfide is soluble) reacts with oxygen gas to yield a solution of zinc sulfate.

The correct skeletal chemical equation for the above reaction is:

- a. $ZnS_{(l)} + O_{2(g)} \rightarrow ZnSO_{4(l)}$ d. $ZnS_{(aq)} + O_{2(g)} \rightarrow ZnSO_{2(aq)}$
b. $ZnS_{(aq)} + O_{2(g)} \rightarrow ZnSO_{4(aq)}$ e. $ZnS_{(aq)} + O_{2(g)} \rightarrow ZnSO_{3(aq)}$
c. $ZnS_{(l)} + O_{2(g)} \rightarrow ZnSO_{3(l)}$

Chapter 11 Practice Test Answer Section

MULTIPLE CHOICE

- | | | |
|------------|--------|---|
| 1. ANS: A | PTS: 1 | |
| 2. ANS: B | PTS: 1 | |
| 3. ANS: B | PTS: 1 | |
| 4. ANS: B | PTS: 1 | |
| 5. ANS: B | PTS: 1 | |
| 6. ANS: B | PTS: 1 | KEY: Types of Reactions; Decomposition |
| 7. ANS: D | PTS: 1 | KEY: Types of Reactions; Single Replacement |
| 8. ANS: A | PTS: 1 | KEY: Types of Reactions; Double Replacement |
| 9. ANS: D | PTS: 1 | KEY: Types of Reactions; Single Replacement |
| 10. ANS: A | PTS: 1 | KEY: Balancing Equations |
| 11. ANS: A | PTS: 1 | KEY: Balancing Equations |
| 12. ANS: A | PTS: 1 | KEY: Predicting Products |
| 13. ANS: B | PTS: 1 | KEY: Single Replacement; |
| 14. ANS: B | PTS: 1 | KEY: Single Replacement; |
| 15. ANS: A | PTS: 1 | KEY: Single Replacement; |
| 16. ANS: B | PTS: 1 | KEY: Single Replacement; |
| 17. ANS: C | PTS: 1 | KEY: Volume to Moles; Molar Volume |
| 18. ANS: A | PTS: 1 | KEY: Predicting Products |
| 19. ANS: B | PTS: 1 | KEY: Predicting Products |
| 20. ANS: A | PTS: 1 | KEY: Predicting Products |
| 21. ANS: B | PTS: 1 | KEY: Predicting Products |
| 22. ANS: A | PTS: 1 | KEY: Predicting Products |
| 23. ANS: D | PTS: 1 | KEY: Predicting Products |
| 24. ANS: C | PTS: 1 | KEY: Predicting Products |
| 25. ANS: C | PTS: 1 | KEY: Predicting Products |
| 26. ANS: B | PTS: 1 | KEY: Predicting Products |
| 27. ANS: C | PTS: 1 | |
| 28. ANS: B | PTS: 1 | |
| 29. ANS: C | PTS: 1 | |
| 30. ANS: D | PTS: 1 | |
| 31. ANS: A | PTS: 1 | |
| 32. ANS: E | PTS: 1 | |
| 33. ANS: A | PTS: 1 | |
| 34. ANS: E | PTS: 1 | |
| 35. ANS: A | PTS: 1 | |
| 36. ANS: A | PTS: 1 | |
| 37. ANS: B | PTS: 1 | |
| 38. ANS: B | PTS: 1 | |
| 39. ANS: B | PTS: 1 | |
| 40. ANS: A | PTS: 1 | |

- 41. ANS: A PTS: 1
- 42. ANS: B PTS: 1
- 43. ANS: B PTS: 1
- 44. ANS: A PTS: 1
- 45. ANS: C PTS: 1
- 46. ANS: B PTS: 1
- 47. ANS: B PTS: 1
- 48. ANS: A PTS: 1
- 49. ANS: B PTS: 1
- 50. ANS: D PTS: 1
- 51. ANS: B PTS: 1
- 52. ANS: A PTS: 1
- 53. ANS: B PTS: 1
- 54. ANS: A PTS: 1
- 55. ANS: D PTS: 1
- 56. ANS: A PTS: 1
- 57. ANS: C PTS: 1
- 58. ANS: D PTS: 1
- 59. ANS: A PTS: 1
- 60. ANS: C PTS: 1
- 61. ANS: C PTS: 1
- 62. ANS: C PTS: 1
- 63. ANS: D PTS: 1
- 64. ANS: B PTS: 1
- 65. ANS: B PTS: 1