



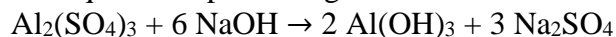
Chemistry

Name: _____

Section _____ CH 10-11 STUDY GUIDE Date: _____

A. Multiple Choice.

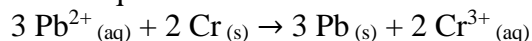
1. Given the balanced equation representing the reaction:



The mole ratio of NaOH to Al(OH)₃ is

- (1) 1:1 (2) 1:3 (3) 3:1 (4) 3:7
2. What is the gram-formula mass of Fe(NO₃)₃?
- (1) 146 g/mol (2) 194 g/mol (3) 214 g/mol (4) 242 g/mol
3. What is the oxidation number of manganese in KMnO₄?
- (1) +7 (2) +2 (3) +3 (4) +4
4. Given the balanced equation representing the reaction:
- $$4 \text{Al}_{(s)} + 3 \text{O}_{2(g)} \rightarrow 2 \text{Al}_2\text{O}_{3(s)}$$
- If 107.9 g of Al react completely with 96.0 g of O₂, what mass of Al₂O₃ will be produced?
- (1) 53.95 g (2) 101.9 g (3) 107.9 g (4) 203.9 g
5. Given the balanced equation representing a reaction:
- $$2 \text{Mg} + \text{O}_2 \rightarrow 2 \text{MgO}$$
- How many moles of O₂ are required to completely react with 4.0 moles of Mg?
- (1) 1.0 moles (2) 2.0 moles (3) 6.0 moles (4) 8.0 moles
6. Given the balanced equation representing the reaction between methane and oxygen:
- $$\text{CH}_4 + 2 \text{O}_2 \rightarrow \text{CO}_2 + 2 \text{H}_2\text{O}$$
- According to this equation, what is the mole ratio of oxygen to methane?
- (1) $\frac{1 \text{ gram O}_2}{2 \text{ grams CH}_4}$ (2) $\frac{2 \text{ grams O}_2}{1 \text{ gram CH}_4}$ (3) $\frac{1 \text{ mole O}_2}{2 \text{ moles CH}_4}$ (4) $\frac{2 \text{ moles O}_2}{1 \text{ mole CH}_4}$
7. Given the balanced equation representing a reaction:
- $$2 \text{KClO}_3 \rightarrow 2 \text{KCl} + 3 \text{O}_2$$
- If 4.0 moles of KClO₃ react completely, how many moles of O₂ should be produced?
- (1) 1.0 moles (2) 2.0 moles (3) 3.0 moles (4) 6.0 moles
8. What is the total number of moles of CO₂ represented by a 340. gram sample?
- (1) 7.72 moles (2) 12.0 moles (3) 16.0 moles (4) 32.0 moles
9. The coefficients in a balanced chemical equation represent
- (1) the mass ratios of the substances in the reaction
- (2) the mole ratios of the substances in the reaction
- (3) the total number of electrons in the reaction
- (4) the total number of elements in the reaction

10. Given the balanced ionic equation:



What is the number of moles of electrons gained by 3.0 moles of lead ions?

- (1) 5.0 mol (2) 2.0 mol (3) 3.0 mol (4) 6.0 mol

B. Short Answer.

Base your answers to questions 11 through 13 on the information below

Baking soda, NaHCO_3 , can be commercially produced during a series of chemical reactions called the Solvay process. In this process, NH_3 (aq), NaCl (aq), and other chemicals are used to produce NaHCO_3 (s) and NH_4Cl (aq).

To reduce production costs, NH_3 (aq) is recovered from the NH_4Cl (aq) through a different series of reactions. This series of reactions can be summarized by the overall reaction represented by the balanced equation shown below.



11. Determine the number of moles of CaO (s) that must be used to completely react with 4.00 moles of NH_4Cl (aq). [2]

2.00 moles

12. Write the chemical name for baking soda. [2]

sodium hydrogen carbonate (sodium bicarbonate is acceptable)

13. Determine the mass of NH_4Cl that represents 4.00 moles of NH_4Cl . [2]

213.97 g

14. Write the correct formula for barium chloride. [2]

BaCl_2

15. In the space below, balance the equation using the smallest whole-number coefficients. [2]



Base your answers to questions 16 and 17 on the information below

Sodium bicarbonate decomposes when heated according to the balanced equation below.



16. Determine the gram-formula mass of NaHCO_3 . [2]

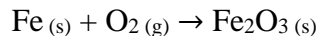
84.0069 g/mol

17. If 6.00 moles of NaHCO_3 decompose, how many moles of CO_2 should be produced? [2]

3.00 moles

Base your answers to questions 18 through 20 on the information below

The nuts, bolts, and hinges that attach some gates to a playground fence can be made of iron. The iron can react with oxygen in the air. The unbalanced equation representing this reaction is shown below.



18. In the space below, balance the equation for the reaction using the smallest whole-number coefficients. [2]



19. Determine the change in oxidation state for oxygen in this reaction. [2]

from 0 to -2 or from O⁰ to O⁻²

20. Explain, in terms of chemical activity, why copper would be a better choice than iron to make the nuts, bolts, and hinges. [2]

Copper has a lower chemical activity than iron.