**Chapter 9 Chemical Names & Formulas Review**

**Select the choice that best answers each question or completes each statement.**

1. Identify the pair in which the formula does not match the name.

 A. sulfite, SO3-2 C. hydroxide, OH-

 B. nitrite, NO3- D. dichromate, Cr2O7-2

2. Which of these compounds are ionic?

 1. CaSO4 2. N2O4 3. NH4NO3 4. CaS

3. What is the name of AlCl3?

 A. aluminum trichloride B. aluminum (III) chloride

 C. aluminum chlorite D. aluminum chloride

4. The Roman numeral in manganese (IV) sulfide indicates the

 A. group number on the periodic table.

 B. positive charge on the manganese ion.

 C. number of manganese ions needed in the formula

 D. number of sulfide ions needed in the formula

5. Which of these statements does not describe every binary molecular compound?

 A. Molecules of binary molecular compounds are composed of two atoms.

 B. The names of binary molecular compounds contain prefixes.

 C. The names of binary molecular compounds end in the suffix *–ide.*

 D. Binary molecular compounds are composed of two nonmetals.

6. What it the formula of ammonium carbonate?

 A. NH4CO3 C. NH3CO4

 B. (NH4)2CO3 D. NH4CO2

**The lettered choices below refer to Questions 7-10.**

**A. QR B. QR2 C. Q2R D. Q2R3**

Which formula shows the correct ratio of ions in the compound formed by each pair of elements.

 **Element Q** **Element R**

7. aluminum sulfur

8. potassium oxygen

9. lithium chlorine

10. strontium bromine

**Chapter 9 Chemical Names & Formulas Review Answers**

1. B 6. B

2. D 7. D

3. D 8. C

4. B 9. A

5. A 10. B

**Chapter 10 Chemical Quantities Review**

1. Choose the term that best completes the second relationship.

 dozen : eggs

 Mole : \_\_\_\_\_\_\_\_\_\_\_

 A. atoms C. size

 B. 6.02 x 1023 D. grams

**Select the choice that best answers each question or completes each statement.**

2. Calculate the molar mass of ammonium phosphate, (NH4)3PO4.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Based on the structural formula below, what is the empirical formula for tartaric acid, a compound found in grape juice.

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4. How many hydrogen atoms are in six molecules of ethylene glycol, C2H6O2?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Which of these compounds has the largest percent by mass of nitrogen?

 A. N2O B. NO

 C. NO2 D. N2O3 E. N2O4

6. Which of these statements is true of a balloon filled with 1.00 mol N2(g) at STP?

 I. The balloon has a volume of 22.4 L.

 II. The contents of the balloon have a mass of 14.0 g.

 III. The balloon contains 6.02 x 1023 molecules.

 A. I only C. I and III only

 B. I and II only D. I, II, and III

7. Allicin, C6H10S2O, is the compound that gives garlic its odor. A sample of allicin contains 3.0 x 1021 atoms of carbon. How many hydrogen atoms does this sample contain?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **For questions 8-10, write the molecular formula for each compound whose structural formula is shown. THEN calculate the compound’s molar mass.**

8. ­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 

9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**Chapter 10 Chemical Quantities Review Answers**

1. a. A b. D 6. C

2. 149.9 g/mol 7. 5.0 x 1021 hydrogen atoms

3. C2H6O6 8. C3H8O, 60.0 g/mol

4. 36 9. C2H5NO, 75.0 g/mol

5. N2O 10. C3H6O2, 74.0 g/mol

**Chapter 11 Chemical Reactions Review**

**Select the choice that best answers each question or completes each statement.**

1. When the equation Fe2O3 + H2 → Fe + H2O is balanced using whole-number coefficients, what is the coefficient of H2?

 A. 6 B. 3 C. 2 D. 1

2. Identify the spectator ion in this reaction.

 Ba(OH)2(aq) + H2SO4(aq) → BaSO4(s) + H2O(l)

 A. Ba2+ B. SO42- C. OH- D. H+ E. There is no spectator ion.

3. Magnesium ribbon reacts with an aqueous solution of copper (II) chloride in a single-replacement reaction. Which are the products of the balanced net ionic equation for the reaction?

 A. Mg2+(aq) + 2Cl-(aq) + Cu(s) D. Cu(s) + 2Cl-(aq)

 B. Mg2+(aq) + Cl-(aq) + Cu(aq)

 C. Mg2+(aq) + Cu(s)

**Use the following descriptions and data table to answer questions 4-6.**

 Dropper bottles labeled P, Q, and R contain one of three aqueous solutions: potassium carbonate, K2CO3; hydrochloric acid, HCL; and calcium nitrate, Ca(NO30)2. The table shows what happens when pairs of solutions are mixed.

|  |  |  |  |
| --- | --- | --- | --- |
| Solution | P | Q | R |
| P | \_\_\_\_\_\_ | Precipitate | No reaction |
| Q | Precipitate | \_\_\_\_\_ | Gas forms. |
| R | No reaction | Gas forms. | \_\_\_\_\_ |

4. Identify the contents of each dropper bottle.

5. Write the net ionic equation for the formation of the precipitate.

6. Write the complete ionic equation for the formation of the gas.

7. Which are the expected products of the decomposition reaction of potassium oxide, K2O?

 A. K+ (s) and O2-(g) B. K+(s) and O(g)

 C. K(s) and O22-(g) C. K(s) and O2(g)

**Use the diagram to answer Questions 8-11.**



8. When ammonium carbonate is heated, water, ammonia, and carbon dioxide are produced. What type of chemical reaction is occurring?

9. Write formulas for the reaction products.

10. Write a balanced equation for the reaction. Include the states for the reasctants and products.

11. Limewater is used to test for the presence of carbon dioxide gas. The products of the reaction of Ca(OH)2 with CO2 are calcium carbonate and water. Write a balanced equation for this reaction.

**Chapter 11 Chemical Reactions Review Answers**

1. B

2. E

3. C

4. P is calcium nitrate, Q is potassium carbonate, and R is hydrochloric acid

5. Ca2+(aq) + CO32-(aq) → CaCO(s)

6. 2K+(aq) + CO32-(aq) + 2H+(aq) + 2Cl-(aq) → 2K+(aq) + 2Cl-(aq) + H2O(l) + CO2(g)

7. D

8. decomposition reaction

9. H2O, NH3, and CO2

10. (NH4)2CO3(s) → 2NH3(g) + CO2(g) + H2O(g)

11. Ca(OH)2 + CO2 → CaCO3 + H2O

**Chapter 12 Stoichiometry Review**

**Select the choice that best answers each question or completes each statement.**

1. Nitric acid is formed by the reaction of nitrogen dioxide with water.

 3NO2(g) + H2O(l) → NO(g) + 2HNO3(aq)

 How many moles of water are needed to react with 8.4 moles of NO2?

 A. 2.8 mol C. 8.4 mol

 B. 3.0 mol D. 25 mol

2. Phosphorous triflouride is formed from its elements. P3(s) + 6F2 → 4PF3(g)

 How many moles of F2 are needed to react with 6.20 g of phosphorous?

 A. 2.85 g C. 11.4 g

 B. 5.70 g D. 37.2 g

3. Magnesium nitride is formed in the reaction of magnesium metal with nitrogen gas.

 3Mg(s) + N2(g) → Mg3N2(s)

 The reaction of 4.0 mol of nitrogen with 6.0 mol of magnesium produces

 A. 2.0 mol Mg3N2(s), and no excess N2.

 B. 2.0 mol Mg3N2(s), and 2.0 mol of excess N2.

 C. 4.0 mol of Mg3N2(s), and 1.0 mol of excess N2.

 D. 6.0 mol of Mg3N2(s), and 3.0 mol of excess N2.

 **Use the reaction below to answer questions 4 and 5.**



4. Write a balanced equation for the reaction between element T and element Q.

5. Based on the atomic windows below, identify the limiting reagent.



For each question, there are two statements. Decide whether each statement is true or false. Then decide whether Statement II is a correct explanation for Statement I.

 Statement I Statement II

6. Every stoichiometry calculation uses **BECAUSE** Every chemical reaction obeys the

a balanced equation. law of conservation of mass.

7. A percent yield is always greater than **BECAUSE** The actual yield in a reaction is

0% and less than 100%. never more than the theoretical yield.

8. The amount of the limiting reagent left **BECAUSE** The limiting reagent is completely

after a reaction is zero. Used up in a reaction.

9. The coefficients in a balanced equation **BECAUSE** The mass of the reactants must equal

represent the relative masses of the the mass of the products in a

reactants and products. chemical equation.

10. A mole ratio is always written with the **BECAUSE** A mole ratio will always be greater

larger number in the numerator. than 1.

**Chapter 12 Standardized Test Prep Answers**

**1. A**

**2. C**

**3. B**

**4. 3T2 + Q2 → 2T3Q**

**5. T2 is the limiting reagent**

**6. True, True, correct explanation**

**7. False, False**

**8. True, True, correct explanation**

**9. False, True**

**10. False, False**