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Chapter 9 Standardized Test Practice

1. Which of the following is not conserved in a chemical reaction?

A. Mass **B.** Atoms **C.** Moles **D.** Mass and atoms

2. The calculated amount of product that should be produced based on the amounts of reactants is known as the:

F. actual yield. **G.** percent yield. **H.** theoretical yield. **J.** minimum yield.

3. Given the reaction $(NH_4)_2CO_3 \rightarrow 2NH_3 + CO_2 + H_2O$, what is the minimum amount of ammonium carbonate that reacts to produce 1.0 mole of ammonia?

A. 0.25 mole **B.** 0.50 mole **C.** 17 moles **D.** 34 moles

4. The mole ratio of two components in a chemical reaction is determined from the:

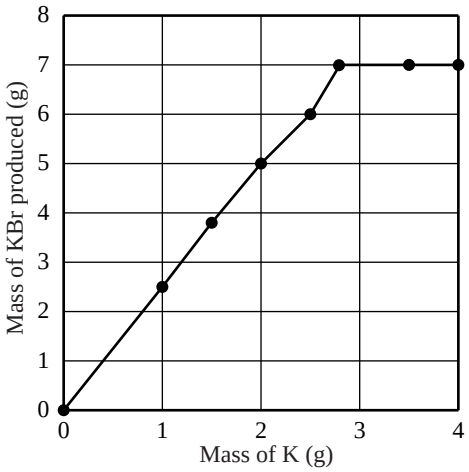
F. coefficients of each component. **H.** volume of each component.

G. mass of each component. **J.** number of atoms of each component.

Passage I

Use the following passage and graph to answer questions 5–7.

A student performs a laboratory experiment in which potassium bromide (KBr) was produced from a reaction involving solid potassium and liquid bromine. The graph below shows the amount of potassium bromide produced for varying amounts of potassium supplied for the reaction.



5. Which substance is the limiting reactant?

A. Solid potassium **C.** Potassium bromide

B. Liquid bromine **D.** Oxygen

6. Based on the graph, estimate the amount of bromine used at the point where the addition of potassium has no effect on the amount of potassium bromide produced.

F. 1.2 g **G.** 2.8 g **H.** 4.2 g **J.** 7.0 g

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7. How many moles of KBr are produced if the reaction yields 7.0 g of KBr?

A. 0.024 mole **B.** 0.036 mole **C.** 0.059 mole **D.** 0.118 mole

8. In a chemical reaction the limiting reactant is the reactant that:

F. has the smallest mass. **H.** has the greatest mass.

G. is used up first. **J.** is not used up.

9. Given the balanced equation $NaOH + HCl \rightarrow NaCl + H_2O$, what is the total number of grams of H_2O produced when 116 g of the product NaCl is formed?

A. 9 g **B.** 18 g **C.** 36 g **D.** 54 g

10. When using a balanced chemical equation to calculate the mass of product produced from a known mass of reactant, you must first convert the mass of the reactant into:

F. number of atoms or molecules. **H.** volume in liters.

G. moles. **J.** scientific notation.

11. Given the balanced equation $2Mg(s) + O_2(g) \rightarrow 2MgO(s)$, if 20.00 g of magnesium react with excess oxygen to produce 28.00 g of magnesium oxide, what is the percent yield?

A. 42.22% **B.** 60.31% **C.** 71.43% **D.** 84.44%

12. Two substances, A and B, react to form two products, X and Y. Table 1 shows the moles of each substance involved in the reaction.

Table 1

Reactants (moles)		Products (moles)	
A	B	X	Y
1.25	0.50	0.75	1.00

Assuming the reaction went to completion, use the data in Table 1 to determine the coefficients that will balance the equation $A + B \rightarrow X + Y$.

F. 5, 3, 4, 2 **G.** 1, 0.75, 0.50, 1 **H.** 4, 2, 3, 5 **J.** 5, 2, 3, 4

13. How many moles of $N_2(g)$ molecules would contain exactly 4.0 moles of nitrogen atoms?

A. 1.0 mole **B.** 2.0 moles **C.** 3.0 moles **D.** 4.0 moles

14. A science teacher has the following supply of chemicals.

Substance	Amount (g)
$AgNO_3$	112.32
Fe	167.55
Cu	85.05

In order to use all of the iron in a reaction to produce iron chloride, how much HCl does the teacher need? The reaction is $Fe + 2HCl \rightarrow FeCl_2 + H_2$.

F. 109.38 g **G.** 111.85 g **H.** 147.71 g **J.** 218.75 g

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Use the following balanced equation to answer questions 15–16.

$2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2$

15. If 3.00 moles of ZnS are combined with 4.00 moles of O_2, how many moles of ZnO can be produced?

A. 2.00 moles **B.** 2.67 moles **C.** 3.00 moles **D.** 5.67 moles

16. How many moles of the excess reactant will be left over after the reaction stops?

F. 0.33 mole **G.** 0.67 mole **H.** 1.00 mole **J.** 1.33 moles

17. Given the balanced equation $2Al(s) + 3CuSO_4(aq) \rightarrow Al_2(SO_4)_3(aq) + 3Cu(s)$, which of the following is a correct interpretation of the equation?

A. 2 grams Al and 3 grams $CuSO_4$ react to form 1 gram $Al_2(SO_4)_3$ and 3 grams Cu.

B. 2 atoms Al and 3 formula units $CuSO_4$ react to form 1 formula unit $Al_2(SO_4)_3$ and 3 atoms Cu.

C. 2 moles Al and 3 moles $CuSO_4$ react to form 1 mole $Al_2(SO_4)_3$ and 3 moles Cu.

D. Both B and C are correct.