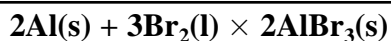


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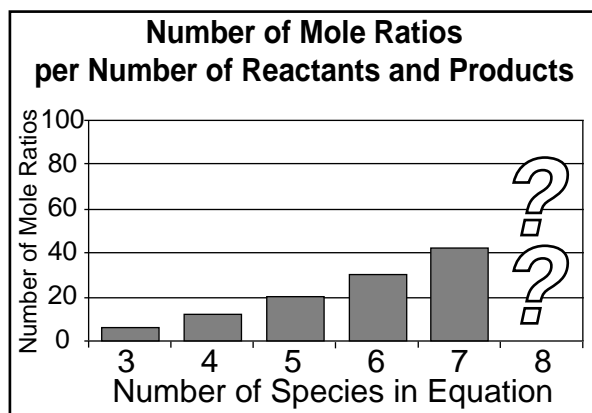
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- 1 A chemist is about to synthesize tetraphosphorus decoxide by combining X grams of phosphorus with sufficient oxygen to react completely with the phosphorus. If he wants to determine the amount of tetraphosphorus decoxide that will be produced, all of the following need to be answered before initiating the experiment EXCEPT —
- A What is the balanced chemical equation for this reaction?
- B What are the number of moles for each reactant?
- C What is the mole ratio of the two reactants?
- D Which is the limiting reactant and which is the excess reactant?
- 2 Three atoms of iron (Fe) are to be combined with four molecules of oxygen (O<sub>2</sub>). How many total iron atoms and oxygen molecules will be combined during the formation of Fe<sub>3</sub>O<sub>4</sub>?
- A 3
- B 4
- C 7
- D 10



- 3 The above equation represents the reaction of aluminum and bromine to form aluminum bromide. Which of these is NOT a mole ratio for this reaction?
- A 2 mol Al:3 mol Br<sub>2</sub>
- B 2 mol AlBr<sub>3</sub>:2 mol AlBr<sub>3</sub>
- C 3 mol Br<sub>2</sub>:2 mol Al
- D 2 mol AlBr<sub>3</sub>:3 mol Br<sub>2</sub>

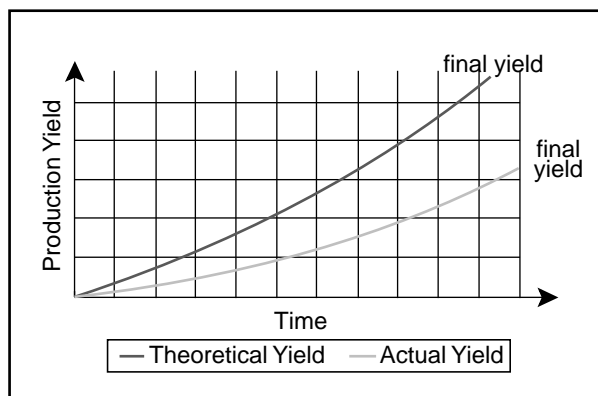
Use the graph below to answer question 4.



- 4 This graph shows the number of mole ratios that can be determined given the number of reactants and products of a chemical reaction. If this trend continues, how many mole ratios can be formed with a chemical reaction that has a sum of eight reactants and products?
- A 54
- B 56
- C 58
- D 60
- 5 Chemists normally use an excess of one reactant in a chemical reaction because —
- A the reaction will continue until all of the limiting reactant is consumed
- B the reaction will continue until all of the excess reactant is consumed
- C reactions do not take place unless there are unequal amounts of reactants
- D reactions occur too quickly if equal amounts of reactants are used

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Use the graph below to answer question 6.



- 6 According to this graph, during a chemical reaction —
- the actual yield is higher than the theoretical yield
  - the calculated percent yield of product will be less than 100%
  - the theoretical and actual yields are equal
  - the percent yield of product is more than 100%
- 7 Stoichiometry is the study of quantitative relationships between amounts of —
- the reactants and products of a chemical reaction relative to time
  - the products of a chemical reaction only
  - the reactants and products of a chemical reaction
  - the reactants of a chemical reaction only
- 8 Which piece of information about an element on the periodic table is most necessary in order to compute the mass of a given molecule?
- The symbol of the elements in the molecule
  - The atomic number of each element in the molecule
  - The number of electrons at each energy level for each element
  - The average atomic mass of one atom of each element in the molecule
- 9 Three moles of carbon dioxide are produced when one mole of propane gas is burned. How many moles of carbon dioxide will be produced if 30 moles of propane gas are burned?
- 10 moles
  - 30 moles
  - 90 moles
  - 120 moles
- 10 In the movie *The Wacky World of Chemistry*, a chemist wrote down the following equation on a chalkboard:  $\text{Ti} + \text{C} + 2\text{Cl}_2 \rightarrow \text{TiCl}_3 + \text{C}$ . This equation is NOT correct because —
- the titanium atoms are not equal on both sides of the equation
  - there are not enough chlorine atoms on the right side of the equation
  - the carbon atoms are equal on both sides of the equation
  - the right side of the equation should have a greater number of atoms than the left side

