



Standardized Test Prep

Answer the following items on a separate piece of paper.

MULTIPLE CHOICE

- In stoichiometry, chemists are mainly concerned with
 - the types of bonds found in compounds.
 - mass relationships in chemical reactions.
 - energy changes occurring in chemical reactions.
 - the speed with which chemical reactions occur.
- Assume ideal stoichiometry in the reaction $\text{CH}_4 + 2\text{O}_2 \longrightarrow \text{CO}_2 + 2\text{H}_2\text{O}$. If you know the mass of CH_4 , you can calculate
 - only the mass of CO_2 produced.
 - only the mass of O_2 reacting.
 - only the mass of $\text{CO}_2 + \text{H}_2\text{O}$ produced.
 - the mass of O_2 reacting and $\text{CO}_2 + \text{H}_2\text{O}$ produced.
- Which mole ratio for the equation $6\text{Li} + \text{N}_2 \longrightarrow 2\text{Li}_3\text{N}$ is incorrect?
 - $\frac{6 \text{ mol Li}}{2 \text{ mol N}_2}$
 - $\frac{1 \text{ mol N}_2}{6 \text{ mol Li}}$
 - $\frac{2 \text{ mol Li}_3\text{N}}{1 \text{ mol N}_2}$
 - $\frac{2 \text{ mol Li}_3\text{N}}{6 \text{ mol Li}}$
- For the reaction below, how many moles of N_2 are required to produce 18 mol NH_3 ?
$$\text{N}_2 + 3\text{H}_2 \longrightarrow 2\text{NH}_3$$
 - 4.5
 - 9.0
 - 18
 - 36
- What mass of NaCl can be produced by the reaction of 0.75 mol Cl_2 ?
$$2\text{Na} + \text{Cl}_2 \longrightarrow 2\text{NaCl}$$
 - 0.75 g
 - 1.5 g
 - 44 g
 - 88 g
- What mass of CO_2 can be produced from 25.0 g CaCO_3 given the decomposition reaction
$$\text{CaCO}_3 \longrightarrow \text{CaO} + \text{CO}_2$$
 - 11.0 g
 - 22.0 g
 - 25.0 g
 - 56.0 g

- If a chemical reaction involving substances A and B stops when B is completely used up, then B is referred to as the
 - excess reactant.
 - primary reactant.
 - limiting reactant.
 - primary product.
- If a chemist calculates the maximum amount of product that could be obtained in a chemical reaction, he or she is calculating the
 - percentage yield.
 - mole ratio.
 - theoretical yield.
 - actual yield.
- What is the maximum number of moles of AlCl_3 that can be produced from 5.0 mol Al and 6.0 mol Cl_2 ?
$$2\text{Al} + 3\text{Cl}_2 \longrightarrow 2\text{AlCl}_3$$
 - 2.0 mol AlCl_3
 - 4.0 mol AlCl_3
 - 5.0 mol AlCl_3
 - 6.0 mol AlCl_3

SHORT ANSWER

- Why is a balanced equation necessary to solve a mass-mass stoichiometry problem?
- What data are necessary to calculate the percentage yield of a reaction?

EXTENDED RESPONSE

- A student makes a compound in the laboratory and reports an actual yield of 120%. Is this result possible? Assuming that all masses were measured correctly, give an explanation.
- Benzene, C_6H_6 , is reacted with bromine, Br_2 , to produce bromobenzene, $\text{C}_6\text{H}_5\text{Br}$, and hydrogen bromide, HBr , as shown below. When 40.0 g of benzene are reacted with 95.0 g of bromine, 65.0 g of bromobenzene is produced.
$$\text{C}_6\text{H}_6 + \text{Br}_2 \longrightarrow \text{C}_6\text{H}_5\text{Br} + \text{HBr}$$
 - Which compound is the limiting reactant?
 - What is the theoretical yield of bromobenzene?
 - What is the reactant in excess, and how much remains after the reaction is completed?
 - What is the percentage yield?

Test TIP

Choose an answer to a question based on both information that you already know and information that is presented in the question.