

Stoichiometry WS #2

1. A gaseous mixture containing 4.15 moles of hydrogen gas and 7.13 moles of oxygen gas reacts to form steam.
 - a. Write a balanced equation for the reaction.
 - b. What is the limiting reactant?
 - c. What is the theoretical yield of steam in moles?
 - d. How many moles of the excess reactant remain unreacted?
2. A gaseous mixture containing 2.45 moles of hydrogen gas and 5.85 moles of solid carbon reacts to form methane (CH_4).
 - a. Write a balanced equation for the reaction.
 - b. What is the limiting reactant?
 - c. What is the theoretical yield of methane in moles?
 - d. How many moles of the excess reactant remain unreacted?
3. What are the percent by masses (% composition) of the elements in $\text{Zn}(\text{NO}_3)_2$? Name this salt.
4. How many oxygen atoms are in 1.00 mole of $\text{Zn}(\text{NO}_3)_2$?
5. What are the percent by masses of the elements in $\text{Cu}(\text{ClO}_4)_2$? Name this salt.

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ANSWERS:

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 - a. $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\text{g})$
 - b. H_2 is limiting reactant
 - c. 4.15 mol H_2O
 - d. 5.05 mol O_2 in excess

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 - a. $2\text{H}_2(\text{g}) + \text{C}(\text{s}) \rightarrow \text{CH}_4(\text{g})$
 - b. H_2 is limiting reactant
 - c. 1.23 mol CH_4
 - d. 4.62 mol C in excess

3. 34.52% Zn; 14.79% N; 50.68% O; zinc nitrate
4. 3.61×10^{24} atoms O
5. 24.21% Cu; 27.01% Cl; 48.77% O; copper (II) perchlorate

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