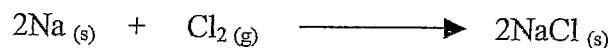


Limiting Reagent The reagent that is completely used up. It limits the amount of product that can be formed.

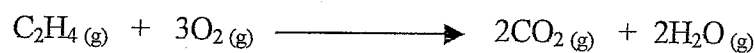
Excess Reagent The reactant that remains after the limiting reagent is used up.

STOICHIOMETRIC CALCULATIONS

1. Sodium chloride can be prepared by the reaction of sodium metal with chlorine gas. What will occur when 6.7 mol of Na reacts with 3.2 mol of Cl₂?

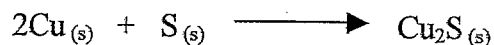


- What is the limiting reagent? (Cl₂)
 - How many moles of NaCl are produced? (6.4 mol)
 - How many moles of the excess reagent remains unreacted? (0.3 mol Na)
2. The equation for the combustion of ethane is:



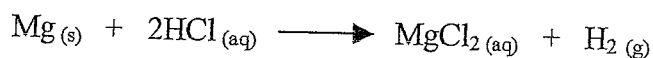
2.7 mol of ethane is reacted with 6.3 mol of oxygen gas.

- Identify the limiting reagent. (O₂)
 - Calculate the moles of water produced. (4.2 mol)
 - Calculate the moles of excess reagent remaining. (0.6 mol)
3. Copper (II) sulfide is formed as a product of the reaction when copper and sulfur are heated together.



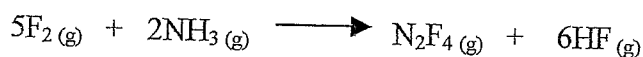
- What is the maximum number of grams of Cu₂S that can be formed when 80g of Cu reacts with 25g of S?

4. Hydrogen gas can be produced in the laboratory by the reaction of magnesium metal with hydrochloric acid.



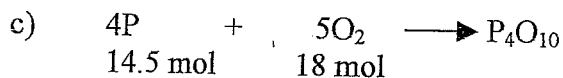
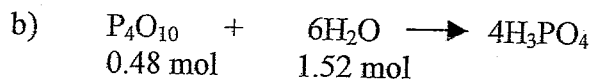
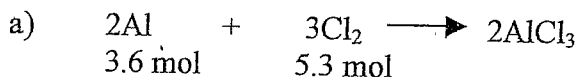
- a) How many grams of hydrogen gas can be produced when 6g of HCl is added to 5g of Mg? (0.164g)
b) Assuming STP, what is the volume of the hydrogen gas? (1.84L)

5. The reaction of fluorine with ammonia produces dinitrogen tetrafluoride and hydrogen fluoride.



- a) If you have 66.6g of NH_3 how many grams of F_2 are needed for complete reaction? (372.4g)
b) How many grams of NH_3 are required to produce 4.65g of HF? (1.32g)
c) How many grams of N_2F_4 can be produced from 225g of F_2 ? (139.4g)

6. Consider the following reactions:



For each reaction calculate

- i) The number of moles of product formed. (a 3.53 mol, b 0.23 mol, c 0.1 mol)
ii) The number of moles of excess reagent remaining. (a 0.07 mol, b 1 mol, c 3.6 mol)