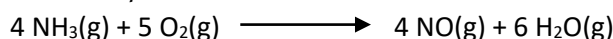


2.6 Limiting Reactant and Excess Reactant – Important NEB questions

1. Given the equation:



- i) How many moles of NH_3 must react to produce 5.0 moles of NO ? (5.0)
- ii) How many moles of O_2 must react to produce 5.0 moles of NO ? (6.25)
- iii) How many litres of NH_3 and O_2 must react to produce 100 litres of NO ? (100 & 125)
- iv) How many liters of O_2 will react with 100g of NH_3 ? (164.7)
- v) How many litres of NO are formed by reacting 10moles of NH_3 with 10 moles of O_2 ? (179.2)

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2. 3.00g of H_2 react with 29.00g of O_2 to yield H_2O .

- a. Which is the limiting reactant? (H_2)
- b. Calculate the maximum amount of H_2O that can be formed. (27)
- c. Calculate the amount of reactants which remain unreacted. (5.00g O_2)

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3. 5 g of pure CaCO_3 if treated with 5g of HCl to produce CaCl_2 , H_2O and CO_2 .

- a) Find which one is the limiting reactant and why? (CaCO_3)
- b) Calculate the mass of CaCl_2 formed. (5.55g)
- c) How many moles of water molecules are produced? (0.05)
- d) Calculate the volume of CO_2 produced at NTP. (1.12 litres)

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4. 10.6g of pure Na_2CO_3 if treated with 7.9 g of HCl to produce NaCl , H_2O and CO_2 .

- i) Find the limiting reagent. (Na_2CO_3)
- ii) Calculate moles of unreacted reagent left over. (0.0164)
- iii) What volume of CO_2 gas is produced at NTP? (2.24 litres)
- iv) Calculate the mass of NaCl formed? (11.7g)

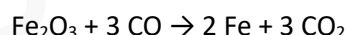
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5. 17g of ammonia is completely reacted with 45g of oxygen to produce NO and H_2O .

- i) Which is the limiting reagent?
- ii) Calculate the number of moles of unreacted reactant left over. (0.156)
- iii) What volume of NO are produced at NTP? (22.4 litres)
- iv) Calculate the mass of water produced. (27g)

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6. Consider a reaction



10g of Fe_2O_3 is reacted with 9g of CO .

- i) Find the limiting reactant.
- ii) How many moles of unreacted reactant are left over? (0.1339)
- iii) Calculate the moles of CO consumed in the reaction. (0.1875moles)
- iv) What mass of NaOH is required to absorb the whole CO_2 produced? (15g)

7. 2.4 g of magnesium is treated with 0.2 mole of sulphuric acid to yield MgSO_4 and H_2 .

- i) Which one is the limiting reactant? (Mg)
- ii) Calculate the mass of unreacted reactant left over. (9.8g)
- iii) How many moles of MgSO_4 are produced? (0.1)
- iv) What mass of water will be produced if the whole H_2 gas formed in the reaction reacts with excess O_2 ? (1.8g)

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8. 8g of pure calcium is treated with 50g of pure HCl to give CaCl_2 and H_2 .

- i) Which is the limiting reactant? (Ca)
- ii) Calculate the mass of unreacted reactant left over. (35.4g)
- iii) What mass of CaCl_2 will be formed? (22.2g)
- iv) How many moles of water will be produced if the whole H_2 formed in the react with O_2 ? (0.2) 5

9. A chemical reaction is carried out by mixing 25g pure Calcium Carbonate and 0.75 mole of pure hydrochloric acid to give CaCl_2 , H_2O and CO_2 .

- i. Which one is the limiting reactant and why? (CaCO_3)
- ii. Calculate the mass of CaCl_2 produced? (27.75g)
- iii. How many water molecules are formed? (1.506×10^{23})
- iv. What mass of NaOH is required to absorb the whole CO_2 produced in the reaction? (20g) 5