Stoichiometric Calculations

1. What volume of Hydrogen will be liberated at STP when 8gm of Calcium completely reacts with water? (AIIMS 2010)

1)0.2 cc 2) 0.4cc 3) 224 cc 4) 4480 cc

Ans: 4 [$Ca + 2 H_2O \rightarrow Ca(OH)_2 + H_2$]

2. 20 Kg of N_2 and 3 Kg of H_2 are mixed to produce NH_3(g).The mass of Ammonia formed is (PMT2011)

1)17Kg 2) 34 Kg 3) 20 Kg 4)3 kg

Ans: 1. [$N_2 + 3H_2 \rightarrow 2NH_3$]

3. What is the volume (lit) of oxygen required at STP to completely convert 1.5 moles of sulphur into sulphurdioxide? (E - 03)

1) 11.2 2) 22.4 3) 33.6 4) 44.8

Ans: 3 [HINT: $S + O_2 \rightarrow SO_2$]

4. 'X' litres of carbonmonoxide is present at STP. It is completely oxidised to CO_2. The volume of CO_2 formed is 11.207 litres at STP. What is the value of 'X' in litres? (E - 2002)

1) 22.414 2) 11.207 3) 5.6035 4) 44.828

Ans: 2 [HINT: $2CO + O_2 \rightarrow 2 CO_2$]

5.One mole of fluorine is reacted with two moles of hot and concentrated KOH. The products formed are KF, H_2O and O_2. The molar ratio of KF, H_2O and O_2 respectively (E - 2002)

1) 1: 1: 2 2) 2: 1: 0.5 3) 1: 2: 1 4) 2: 1: 2

Ans: 2 [$2F_2 + 4KOH \rightarrow 4KF + 2H_2O + O_2$]

6. 10 g of $CaCO_3$ is completely decomposed to X and CaO. X is passed into an aqueous solution containing one mole of sodium carbonate. What is the number of moles of sodium bicarbonate formed? (M - 2004)

1) 0.2 2) 0.1 3) 0.01 4) 10

Ans: 1 [$CaCO_3 \rightarrow CaO + CO_2$ and $Na_2CO_3 + H_2O + CO_2 \rightarrow 2NaHCO_3$]

7. What is the volume (in litres) of CO_2 liberated at STP, when 2.12gms of sodium carbonate (MW=106) is treated with excess dilute HCl? (E - 2000)

1) 2.28 2) 0.448 3) 44.8 4) 22.4

Ans: 3 [$Na_2CO_3 + 2HCl \rightarrow 2$ NaCl + $H_2O + CO_2$]

8. Two grams of sulphur is completely burnt in oxygen to form SO_2. In this reaction, what is the volume (in litres) of oxygen consumed at STP? (At.wts. of sulphur and oxygen are 32 and 16 respectively) (E2002)

1) 16/22.414 2) 22.414/16 3) 22.414/32 4) 32/22.414

Ans: 2 [$S+O_2 \rightarrow SO_2$]

9. At T (K), 100 litres of dry oxygen is present in a sealed container. It is subjected to silent electric discharge, till the volumes of oxygen and ozone become equal. What is the volume (in litres) of ozone formed at T (K)? (E-2006)

1) 50 2) 60 3) 30 4) 40

Ans: 4 [$3O_2 \rightarrow 2O_3$]

10. 'S' grams of calcium carbonate were completely burnt in air. The weight of the solid residue formed is 28 g. What is the value of 'S' (in grams)? (E - 2005)

1) 44 2) 200 3) 150 4) 50

Ans: 4 [$CaCO_3 \rightarrow CaO + CO_2$]