

There are two Sections in this Exam.

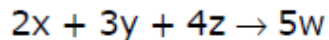
Section 1:

Single Correct Questions (Each question carries +4 marks for correct answer and – 1 mark for wrong answer, 0 marks for not attempting)

Section 2:

Integer type questions (Each question carries +4 marks for correct answer and 0 mark for wrong answer and not attempting.)

For the reaction

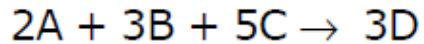


Initially if 1 mole of x, 3 mole of y and 4 mole of z is taken. If 1.25 mole of w is obtained then % yield of this reaction is _____.

Ratio of masses of H_2SO_4 and $\text{Al}_2(\text{SO}_4)_3$ is grams each containing 32 grams of **S** is _____.

The vapour density of a mixture of gas A (Molecular mass = 40) and gas B (Molecular mass = 80) is 25. Then mole % of gas B in the mixture would be

For the reaction



Initially if 2 mole of A, 4 mole of B and 6 mole of C is taken, With 25% yield, moles of D which can be produced are _____.

Equal volumes of 10% (v/v) of HCl is mixed with 10% (v/v) NaOH solution. If density of pure NaOH is 1.5 times that of pure HCl then the resultant solution be :

(A) basic

(B) neutral

(C) acidic

(D) can't be predicted.

A definite amount of gaseous hydrocarbon was burnt with just sufficient amount of O_2 . The volume of all reactants was 600 ml, after the explosion the volume of the products [$CO_2(g)$ and $H_2O(g)$] was found to be 700 ml under the similar conditions. The molecular formula of the compound is :

- (A) C_3H_8 (B) C_3H_6 (C) C_3H_4 (D) C_4H_{10}

One gram of the silver salt of an organic dibasic acid yields, on strong heating, 0.5934 g of silver. If the weight percentage of carbon in it 8 times the weight percentage of hydrogen and half the weight percentage of oxygen, determine the molecular formula of the acid. [Atomic weight of Ag = 108]

- (A) $C_4H_6O_4$ (B) $C_4H_6O_6$ (C) $C_2H_6O_2$ (D) $C_5H_{10}O_5$

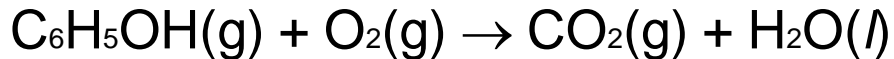
One mole mixture of CH_4 & air (containing 80% N_2 20% O_2 by volume) of a composition such that when underwent combustion gave maximum heat (assume combustion of only CH_4). Then which of the statements are correct, regarding composition of initial mixture. (X presents mole fraction)

$$(A) \quad X_{\text{CH}_4} = \frac{1}{11}, X_{\text{O}_2} = \frac{2}{11}, X_{\text{N}_2} = \frac{8}{11}$$

$$(B) \quad X_{\text{CH}_4} = \frac{3}{8}, X_{\text{O}_2} = \frac{1}{8}, X_{\text{N}_2} = \frac{1}{2}$$

$$(C) \quad X_{\text{CH}_4} = \frac{1}{6}, X_{\text{O}_2} = \frac{1}{6}, X_{\text{N}_2} = \frac{2}{3}$$

(D) Data insufficient



Magnitude of volume change if 30 ml of $\text{C}_6\text{H}_5\text{OH}(\text{g})$ is burnt with excess amount of oxygen, is

(A) 30 ml (B) 60 ml (C) 20 ml (D) 10 ml

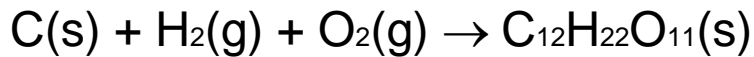
10 ml of a compound containing 'N' and 'O' is mixed with 30 ml of H_2 to produce H_2O (l) and 10 ml of N_2 (g). Molecular formula of compound if both reactants reacts completely, is

- (A) N_2O (B) NO_2 (C) N_2O_3 (D) N_2O_5

Similar to the % labelling of oleum, a mixture of H_3PO_4 and P_4O_{10} is labelled as $(100 + x) \%$ where x is the maximum mass of water which can react with P_4O_{10} present in 100 gm mixture of H_3PO_4 and P_4O_{10} . If such a mixture is labelled as 127% Mass of P_4O_{10} is 100 gm of mixture, is

- (A) 71 gm (B) 47 gm (C) 83gm (D) 35 gm

Mass of sucrose $\text{C}_{12}\text{H}_{22}\text{O}_{11}$ produced by mixing 84 gm of carbon, 12 gm of hydrogen and 56 lit. O_2 at 1 atm & 273 K according to given reaction, is



(A) 138.5 (B) 155.5 (C) 172.5 (D) 199.5

If 50 gm oleum sample rated as 118% is mixed with 18 gm water, then the correct option is

- (A) The resulting solution contains 18 gm of water and 118 gm H_2SO_4
- (B) The resulting solution contains 9 gm of water and 59 gm H_2SO_4
- (C) The resulting solution contains only 118 gm pure H_2SO_4
- (D) The resulting solution contains 68 gm of pure H_2SO_4

In the quantitative determination of nitrogen using Duma's method, N_2 gas liberated from 0.42 gm of a sample of organic compound was collected over water.

If the volume of N_2 gas collected was $\frac{100}{11}$ ml at total pressure 860 mm Hg at 250 K, % by mass of nitrogen in the organic compound is

[Aq. tension at 250K is 24 mm Hg and $R = 0.08 \text{ L atm mol}^{-1} \text{ K}^{-1}$]

- (A) $\frac{10}{3}\%$ (B) $\frac{5}{3}\%$ (C) $\frac{20}{3}\%$ (D) $\frac{100}{3}\%$

40 gm of a carbonate of an alkali metal or alkaline earth metal containing some inert impurities was made to react with excess HCl solution. The liberated CO_2 occupied 12.315 lit. at 1 atm & 300 K. The correct option is

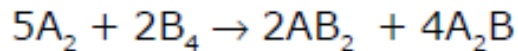
- (A) Mass of impurity is 1 gm and metal is Be
- (B) Mass of impurity is 3 gm and metal is Li
- (C) Mass of impurity is 5 gm and metal is Be
- (D) Mass of impurity is 2 gm and metal is Mg

The percentage by mole of NO_2 in a mixture $\text{NO}_2(\text{g})$ and $\text{NO}(\text{g})$ having average molecular mass 34 is :

- (A) 25% (B) 20% (C) 40% (D) 75%

The minimum mass of mixture of A_2 and B_4 required to produce at least 1 kg of each product is :

(Given At. mass of 'A' = 10; At mass of 'B' = 120)



(A) 2120 gm (B) 1060 gm (C) 560 gm (D) 1660 gm

____ The mass of CO_2 produced from 620 gm mixture of $\text{C}_2\text{H}_4\text{O}_2$ & O_2 , prepared to produce maximum energy is
(A) 413.33 gm (B) 593.04 gm (C) 440 gm (D) 320 gm

Assuming complete precipitation of AgCl , calculate the sum of the molar concentration of all the ions if 2 lit of 2M Ag_2SO_4 is mixed with 4 lit of 1 M NaCl solution is :

(A) 4M

(B) 2M

(C) 3M

(D) 2.5 M

12.5 gm of fuming H_2SO_4 (labelled as 112%) is mixed with 100 lit. of water. Molar concentration of H^+ in resultant solution is :

[Note : Assume that H_2SO_4 dissociate completely and there is no change in volume on mixing]

- (A) $\frac{2}{700}$ (B) $\frac{2}{350}$ (C) $\frac{3}{350}$ (D) $\frac{3}{700}$

74 gm of sample on complete combustion gives 132 gm CO_2 and 54 gm of H_2O . The molecular formula of the compound may be

- (A) C_5H_{12} (B) $\text{C}_4\text{H}_{10}\text{O}$ (C) $\text{C}_3\text{H}_6\text{O}_2$ (D) $\text{C}_3\text{H}_7\text{O}_2$

The % by volume of C_4H_{10} in a gaseous mixture of C_4H_{10} , CH_4 and CO is 40. When 200 ml of the mixture is burnt in excess of O_2 . Find volume (in ml) of CO_2 produced.

- (A) 220 (B) 340 (C) 440 (D) 560

What volumes should you mix of 0.2 M NaCl and 0.1 M CaCl_2 solution so that in resulting solution the concentration of positive ion is 40% lesser than concentration of negative ion. Assuming total volume of solution 1000 ml.

- (A) 400 ml NaCl, 600 ml CaCl_2
- (B) (B) 600 ml NaCl, 400 ml CaCl_2
- (C) 800 ml NaCl, 200 ml CaCl_2
- (D) None of these

An iodized salt contains 0.5% of NaI. A person consumes 3 gm of salt everyday. The number of iodide ions going into his body everyday is

(A) 10^{-4} (B) 6.02×10^{-4} (C) 6.02×10^{19} (D) 6.02×10^{23}

The pair of species having same percentage (mass) of carbon is :

- (A) CH_3COOH and $\text{C}_6\text{H}_{12}\text{O}_6$
- (B) CH_3COOH and $\text{C}_2\text{H}_5\text{OH}$
- (C) HCOOCH_3 and $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
- (D) $\text{C}_6\text{H}_{12}\text{O}_6$ and $\text{C}_{12}\text{H}_{22}\text{O}_{11}$

200 ml of a gaseous mixture containing CO , CO_2 and N_2 on complete combustion in just sufficient amount of O_2 showed contraction of 40 ml. When the resulting gases were passed through KOH solution it reduces by 50 % then calculate the volume ratio of $V_{\text{CO}_2} : V_{\text{CO}} : V_{\text{N}_2}$ in original mixture.

(A) 4 : 1 : 5 (B) 2 : 3 : 5 (C) 1 : 4 : 5 (D) 1 : 3 : 5

... Density of a gas relative to air is 1.17. Find the mol. mass of the gas. [$M_{\text{air}} = 29 \text{ g/mol}$]

- (A) 33.9 (B) 24.7 (C) 29 (D) 22.3