

Q1. 21 January Shift 1

14.0 g of calcium metal is allowed to react with excess HCl at 1.0 atm pressure and 273 K. Which of the following statements is incorrect?

[Given : Molar mass in gmol^{-1} of Ca = 40, Cl = 35.5, H = 1]

- (1) 0.35 mol of H_2 gas is evolved. (2) 7.84 L of H_2 gas is evolved.
(3) The limiting reagent is calcium metal. (4) 33.3 g of CaCl_2 is produced.

Q2. 21 January Shift 1

80 mL of a hydrocarbon on mixing with 264 mL of oxygen in a closed U-tube undergoes complete combustion. The residual gases after cooling to 273 K occupy 224 mL. When the system is treated with KOH solution, the volume decreases to 64 mL. The formula of the hydrocarbon is :

- (1) C_2H_2 (2) C_2H_4 (3) C_2H_6 (4) C_4H_{10}

Q3. 21 January Shift 2

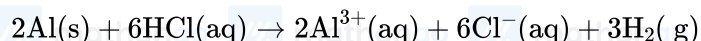
Aqueous HCl reacts with $\text{MnO}_2(\text{s})$ to form $\text{MnCl}_2(\text{aq})$, $\text{Cl}_2(\text{g})$ and $\text{H}_2\text{O}(\text{l})$. What is the weight (in g) of Cl_2 liberated when 8.7 g of $\text{MnO}_2(\text{s})$ is reacted with excess aqueous HCl solution?

(Given Molar mass in gmol^{-1} Mn = 55, Cl = 35.5, O = 16, H = 1)

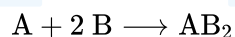
- (1) 21.3 (2) 71 (3) 14.2 (4) 7.1

Q4. 22 January Shift 1

In the reaction,



- (1) 11.2 $\text{LH}_2(\text{g})$ at STP is produced for every mole of HCl consumed.
(2) 33.6 $\text{LH}_2(\text{g})$ is produced regardless of temperature and pressure for every mole of Al that reacts.
(3) 12 $\text{LHCl}(\text{aq})$ is consumed for every 6 $\text{LH}_2(\text{g})$ produced.
(4) 67.2 $\text{LH}_2(\text{g})$ at STP is produced for every mole of Al that reacts.

Q5. 22 January Shift 2

36.0 g of 'A' (Molar mass: 60 g mol^{-1}) and 56.0 g of 'B' (Molar mass: 80 g mol^{-1}) are allowed to react. Which of the following statements are correct ?

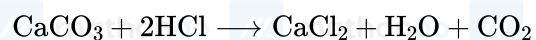
- A. 'A' is the limiting reagent.
B. 77.0 g of AB_2 is formed.
C. Molar mass of AB_2 is 140 g mol^{-1} .
D. 15.0 g of A is left unreacted after the completion of reaction.

Choose the correct answer from the options given below :

- (1) C and D Only (2) A and B Only
(3) A and C Only (4) B and D Only

Q6. 28 January Shift 2

For the given reaction:



If 90 g CaCO_3 is added to 300 mL of HCl which contains 38.55% HCl by mass and has density 1.13 g mL^{-1} , then which of the following option is correct ?

Given molar mass of H, Cl, Ca and O are 1, 35.5, 40 and 16 g mol^{-1} respectively.

- (1) 64.97 g of HCl remains unreacted
- (2) 60.32 g of HCl remains unreacted
- (3) 97.30 g of HCl reacted
- (4) 32.85 g of CaCO_3 remains unreacted

ANSWER KEYS

1. (4) 2. (1) 3. (4) 4. (1) 5. (4) 6. (1)