

**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  $\text{gmol}^{-1}$  of Ca – 40, Cl – 35.5, H – 1]

- (1) 0.35 mol of  $\text{H}_2$  gas is evolved. (2) 7.84 L of  $\text{H}_2$  gas is evolved.  
 (3) The limiting reagent is calcium metal. (4) 33.3 g of  $\text{CaCl}_2$  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)  $\text{C}_2\text{H}_2$  (2)  $\text{C}_2\text{H}_4$  (3)  $\text{C}_2\text{H}_6$  (4)  $\text{C}_4\text{H}_{10}$

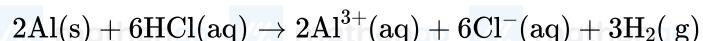
**Q3. 21 January Shift 2**

Aqueous HCl reacts with  $\text{MnO}_2(s)$  to form  $\text{MnCl}_2(aq)$ ,  $\text{Cl}_2(g)$  and  $\text{H}_2\text{O}(l)$ . What is the weight (in g) of  $\text{Cl}_2$  liberated when 8.7 g of  $\text{MnO}_2(s)$  is reacted with excess aqueous HCl solution?  
 (Given Molar mass in  $\text{gmol}^{-1}$  Mn = 55, Cl = 35.5, O = 16, H = 1)

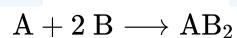
- (1) 21.3 (2) 71 (3) 14.2 (4) 7.1

**Q4. 22 January Shift 1**

In the reaction,



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

**Q5. 22 January Shift 2**

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

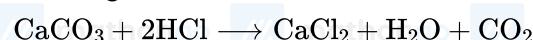
- A. 'A' is the limiting reagent.  
 B. 77.0 g of  $\text{AB}_2$  is formed.  
 C. Molar mass of  $\text{AB}_2$  is  $140\text{ g mol}^{-1}$ .  
 D. 15.0 g of A is left unreacted after the completion of reaction.

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<sub>3</sub> is added to 300 mL of HCl which contains 38.55% HCl by mass and has density 1.13 g mL<sup>-1</sup>, 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<sup>-1</sup> 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<sub>3</sub> remains unreacted**ANSWER KEYS**

1. (4)

2. (1)

3. (4)

4. (1)

5. (4)

6. (1)