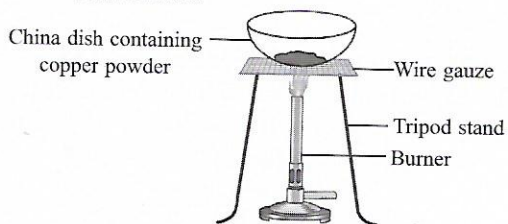


## CHEMISTRY

14. 0.34 gram of a hydrocarbon when treated with methyl magnesium iodide gives 112 mL of  $\text{CH}_4$  at STP. Possible structure of the hydrocarbon is

- A.  $(\text{CH}_3)_2\text{CH}-\text{C}\equiv\text{C}-\text{H}$   
 B.  $\text{CH}_3-(\text{CH}_2)_3-\text{C}\equiv\text{CH}$   
 C.  $(\text{CH}_3)_3\text{C}-\text{C}\equiv\text{C}-\text{H}$   
 D. Both B and C.

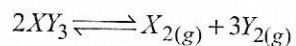
15. Observe the given figure carefully and identify the correct statements.



- (i) Copper is being oxidised.  
 (ii) The surface of copper powder gets coated with black copper(II) oxide.  
 (iii) If hydrogen gas is passed over this heated material ( $\text{CuO}$ ), the black coating on the surface turns brown.  
 (iv) During the reaction given in (iii), copper(II) oxide is acting as an oxidising agent.

- A. (i), (iii) and (iv) only  
 B. (ii) and (iv) only  
 C. (i) and (iii) only  
 D. (i), (ii), (iii) and (iv)

16. 8 moles of a gas  $\text{XY}_3$  attain equilibrium in a closed container of volume  $1 \text{ dm}^3$  as,



If at equilibrium, 2 moles of  $\text{X}_2$  are present, then equilibrium constant is

- A.  $36 \text{ mol}^2 \text{ L}^{-2}$   
 B.  $3 \text{ mol}^2 \text{ L}^{-2}$   
 C.  $27 \text{ mol}^2 \text{ L}^{-2}$   
 D.  $72 \text{ mol}^2 \text{ L}^{-2}$

17. Match column I (atomic numbers of elements) with column II (periods to which they belong) and select the correct option from the given codes.

Column I	Column II
P. 31	(i) 5
Q. 50	(ii) 3
R. 56	(iii) 4
S. 14	(iv) 6

- A. P-(i), Q-(ii), R-(iii), S-(iv)  
 B. P-(ii), Q-(i), R-(iv), S-(iii)  
 C. P-(iii), Q-(iv), R-(i), S-(ii)  
 D. P-(iii), Q-(i), R-(iv), S-(ii)

18. Which of the following statements is incorrect regarding group 14 elements?

- A. The stability order of dihalides is  $\text{SiX}_2 < \text{GeX}_2 < \text{SnX}_2 < \text{PbX}_2$ .  
 B.  $\text{MeSiCl}_3$  on hydrolysis and subsequent condensation will produce  $\text{MeSi}(\text{OH})_3$ .  
 C. Maximum co-ordination number of carbon in commonly occurring compounds is 4, whereas that of silicon is 6.  
 D. The order of boiling points of hydrides is  $\text{CH}_4 < \text{SiH}_4 < \text{GeH}_4 < \text{SnH}_4$ .

19. Which of the following is an example of a basic buffer?

- A.  $\text{NH}_4\text{OH} + \text{NH}_4\text{Cl}$   
 B.  $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONa}$   
 C.  $\text{CH}_3\text{COONH}_4 + \text{CH}_3\text{COOH}$   
 D.  $\text{CH}_3\text{COONH}_4 + \text{NH}_4\text{OH}$

20. A mixture of ethane and ethene occupies 41 L at 1 atm and 500 K. The mixture reacts completely with  $\frac{10}{3}$  mol of  $\text{O}_2$  to produce  $\text{CO}_2$  and  $\text{H}_2\text{O}$ . The mole fractions of ethane and ethene in the mixture are respectively ( $R = 0.082 \text{ L atm K}^{-1} \text{ mol}^{-1}$ )

- A. 0.50 and 0.50  
 B. 0.75 and 0.25  
 C. 0.67 and 0.33  
 D. 0.25 and 0.75

21. Read the given statements and select the correct option.

Statement 1 : The sulphide ores are converted into oxides by calcination.

Statement 2 : Calcination is the process in which the ore is heated strongly in presence of excess air.

- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.  
 B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.  
 C. Statement 1 is true but statement 2 is false.  
 D. Both statements 1 and 2 are false.