



# PAPER SOLUTION

From Meerut

# JEE MAIN

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1<sup>st</sup>

# 2025

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# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q.** Which of the following is animal starch?

- A** Glycogen
- B** Lactose
- C** Amylopectin
- D** Amylose

iii) *Glycogen*: The carbohydrates are stored in animal body as glycogen. It is also known as *animal starch* because its structure is similar to amylopectin and is rather more highly branched. It is present in liver, muscles and brain. When the body needs glucose, enzymes break the glycogen down to glucose. Glycogen is also found in yeast and fungi.

(i) *Starch*: Starch is the main storage polysaccharide of plants. It is the most important dietary source for human beings. High content of starch is found in cereals, roots, tubers and some vegetables. It is a polymer of  $\alpha$ -glucose and consists of two components—**Amylose** and **Amylopectin**. Amylose is water soluble component which constitutes about 15-20% of starch. Chemically amylose is a long unbranched chain with 200-1000  $\alpha$ -D-(+)-glucose units held together by C1- C4 glycosidic linkage.

**Ans. (A)**



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q. Statement – 1 : Correct order of ionic radius for  $Mg^{2+}$ ,  $Na^+$ ,  $O^{2-}$  &  $F^-$  is  $F^- > O^{2-} > Na^+ > Mg^{2+}$**

**Statement – 2 : Correct order of magnitude of gain Enthalpy of 17<sup>th</sup> group follows order  $Cl > F > Br > I$  (Magnitude only).**

- A** Both statement I & statement II are correct.
- B** Both statement I & statement II are incorrect.
- C** Statement I is correct but statement II is incorrect.
- D** Statement I is incorrect but statement II is correct.

**Ans. (D)**



# JEE MAIN 2025 LIVE PAPER DISCUSSION

## (b) Ionic Radius

The removal of an electron from an atom results in the formation of a **cation**, whereas gain of an electron leads to an **anion**. The ionic radii can be estimated by measuring the distances between cations and anions in ionic crystals. In general, the ionic radii of elements exhibit the same trend as the atomic radii. A cation is smaller than its parent atom because it has fewer electrons while its nuclear charge remains the same. The size of an anion will be larger than that of the parent atom because the addition of one or more electrons would result in increased repulsion among the electrons and a decrease in effective nuclear charge. For example, the ionic radius of fluoride ion ( $F^-$ ) is 136 pm whereas the atomic radius of fluorine is only 64 pm. On the other hand, the atomic radius of sodium is 186 pm compared to the ionic radius of 95 pm for  $Na^+$ .

When we find some atoms and ions which contain the same number of electrons, we call them **isoelectronic species\***. For example,  $O^{2-}$ ,  $F^-$ ,  $Na^+$  and  $Mg^{2+}$  have the same number of electrons (10). Their radii would be different because of their different nuclear charges. The

halogens

cation with the greater positive charge will have a smaller radius because of the greater attraction of the electrons to the nucleus. Anion with the greater negative charge will have the larger radius. In this case, the net repulsion of the electrons will outweigh the nuclear charge and the ion will expand in size.

### Problem 3.5

Which of the following species will have the largest and the smallest size?  
 $Mg$ ,  $Mg^{2+}$ ,  $Al$ ,  $Al^{3+}$ .

### Solution

Atomic radii decrease across a period. Cations are smaller than their parent atoms. Among isoelectronic species, the one with the larger positive nuclear charge will have a smaller radius.

Hence the largest species is  $Mg$ ; the smallest one is  $Al^{3+}$ .

## (c) Ionization Enthalpy

A quantitative measure of the tendency of an element to lose electron is given by its **Ionization Enthalpy**. It represents the energy required to remove an electron from an isolated gaseous atom (X) in its ground state.

| Group 17  | $\Delta_{eg} H$ |
|-----------|-----------------|
|           |                 |
| <b>F</b>  | - 328           |
| <b>Cl</b> | - 349           |
| <b>Br</b> | - 325           |
| <b>I</b>  | - 295           |
| <b>At</b> | - 270           |



# JEE MAIN 2025 LIVE PAPER DISCUSSION

#Q. Calculate the total number of  $\sigma$  and  $\pi$  bond in the given molecule?



Ans. 15



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q. Chromite ore +  $\text{Na}_2\text{CO}_3$  +  $\text{O}_2$   $\longrightarrow$  insoluble product containing Fe  
Calculate the molar mass of insoluble product formed. (Given : Molar mass of Cr = 52 g/mol, Na = 23 g/mol, Fe = 56 g/mol, O = 16g/mol)**

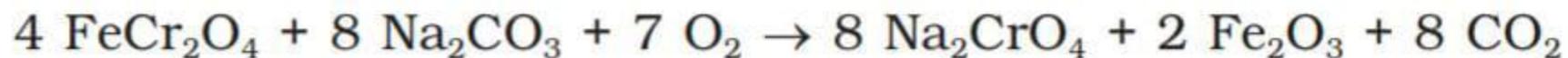
**Ans. 160**



# JEE MAIN 2025 LIVE PAPER DISCUSSION

## *Potassium dichromate $K_2Cr_2O_7$*

Potassium dichromate is a very important chemical used in leather industry and as an oxidant for preparation of many azo compounds. Dichromates are generally prepared from chromate, which in turn are obtained by the fusion of chromite ore ( $FeCr_2O_4$ ) with sodium or potassium carbonate in free access of air. The reaction with sodium carbonate occurs as follows:



The yellow solution of sodium chromate is filtered and acidified with sulphuric acid to give a solution from which orange sodium dichromate,  $Na_2Cr_2O_7 \cdot 2H_2O$  can be crystallised.





# JEE MAIN 2025 LIVE PAPER DISCUSSION

#Q. Consider the following complexes:



(1)



(2)



(3)



(4)

**A**  $4 > 3 > 2 > 1$

**B**  $3 > 4 > 1 > 2$

**C**  $3 > 1 > 4 > 2$

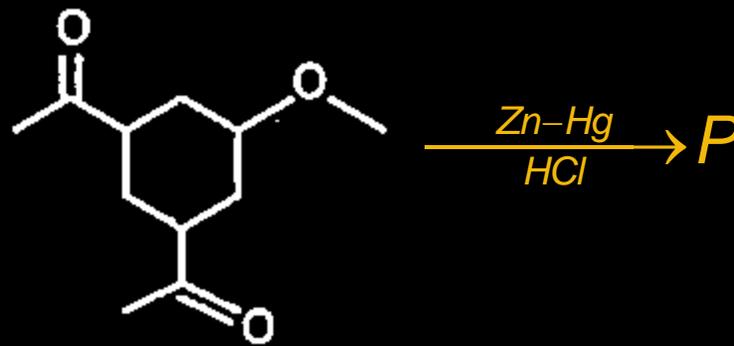
**D**  $3 > 4 > 2 > 1$

Ans. (A)



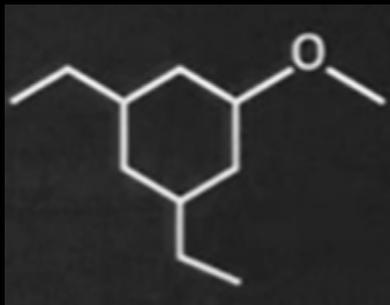
# JEE MAIN 2025 ▶ LIVE PAPER DISCUSSION

#Q. Consider the following reaction

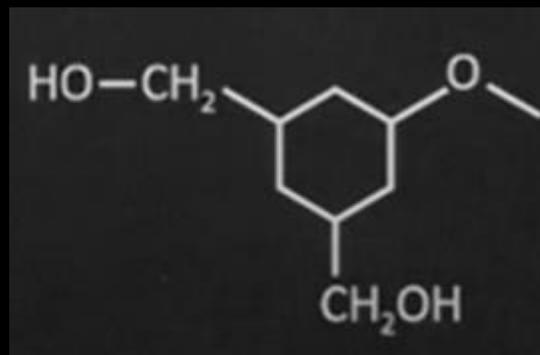


Identify the final product P.

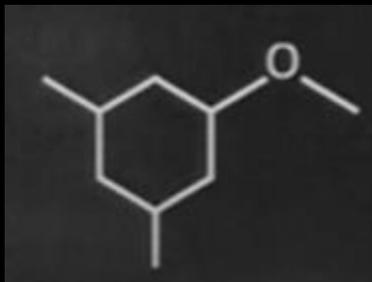
**A**



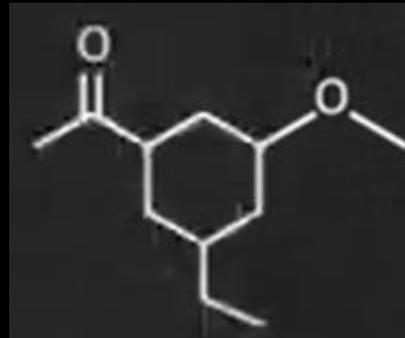
**B**



**C**



**D**



Ans. (A)



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q.** If  $A_2B$  is dissociated, what is the value of van't Hoff factor for  $A_2B$  is 30%.

**A** 1.60

**B** 1.30

**C** 1.50

**D** 1.20

**Ans. (A)**



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q.** Find the order of the reaction.



if the mechanism of the reaction is given below:



**A** 1

**B** 2

**C** 3

**D** 4

Ans. (B)



# JEE MAIN 2025 LIVE PAPER DISCUSSION

#Q. What is the correct Nernst equation representation for the following cell reaction .



**A**  $E_{\text{cell}} = E_{\text{cell}}^{\circ} - \frac{RT}{2F} \ln \frac{[\text{Mg}^{2+}]}{[\text{Ag}^{+}]^2}$

**B**  $E_{\text{cell}} = E_{\text{cell}}^{\circ} - \frac{RT}{2F} \ln \frac{[\text{Ag}^{+}]^2}{[\text{Mg}^{2+}]}$

**C**  $E_{\text{cell}} = E_{\text{cell}}^{\circ} + \frac{RT}{1F} \ln \frac{[\text{Mg}^{2+}]}{[\text{Ag}^{+}]}$

**D**  $E_{\text{cell}} = E_{\text{cell}}^{\circ} + \frac{RT}{1F} \ln \frac{[\text{Ag}^{+}]}{[\text{Mg}^{2+}]}$

Ans. (A)



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q. Match the following**

| List – I |                                 | List – II |                         |
|----------|---------------------------------|-----------|-------------------------|
| A.       | $[\text{Co}(\text{OX})_3]^{3-}$ | 1.        | $\text{sp}^3\text{d}^2$ |
| B.       | $[\text{FeF}_6]^{3-}$           | 2.        | $\text{d}^2\text{sp}^3$ |
| C.       | $[\text{Ni}(\text{CO})_4]$      | 3.        | $\text{dsp}^3$          |
| D.       | $[\text{PtCl}_4]^{2-}$          | 4.        | $\text{sp}^3$           |

**A** A–2, B–1, C–4, D–3

**B** A–1, B–2, C–4, D–3

**C** A–1, B–2, C–3, D–4

**D** A–2, B–1, C–3, D–4

Ans. (A)



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q.** The correct order of melting point of d–block element is:

**A**  $Tc > Ru$

**B**  $Fe > Mn$

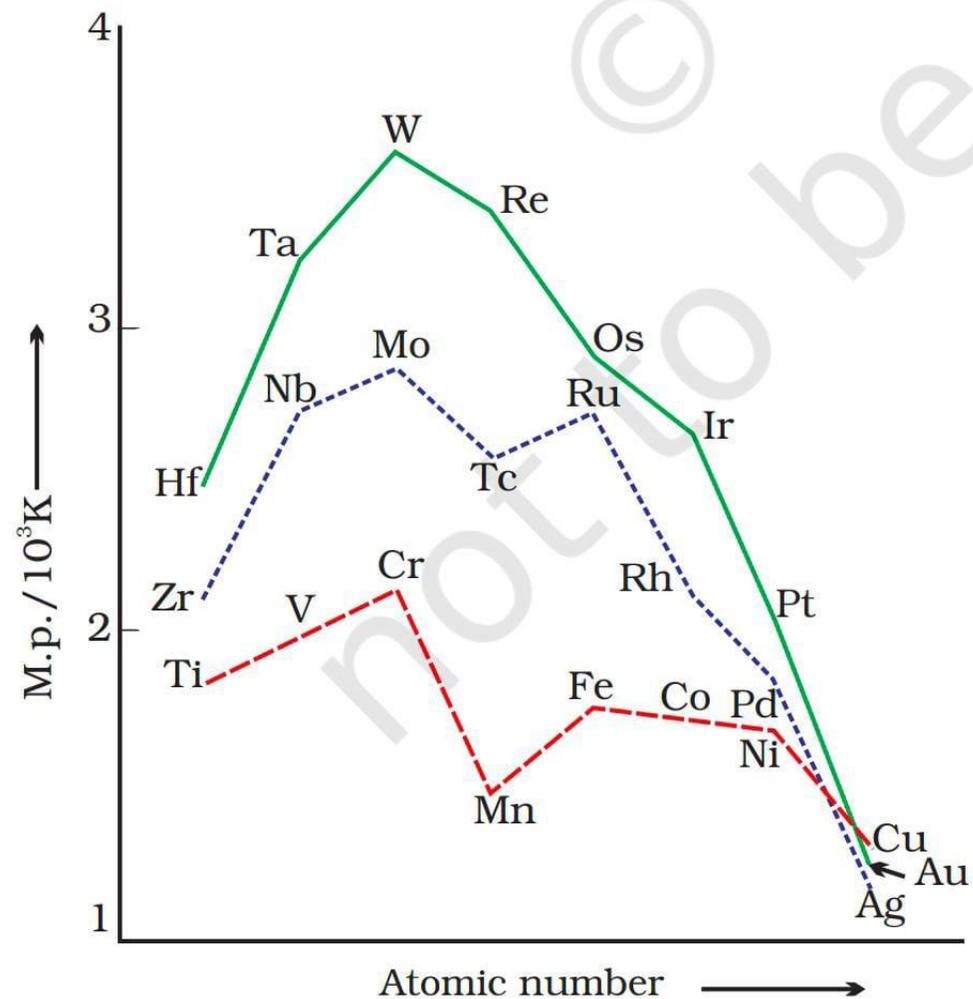
**C**  $Os > Re$

**D**  $Ta > W$

**Ans. (B)**



# JEE MAIN 2025 LIVE PAPER DISCUSSION

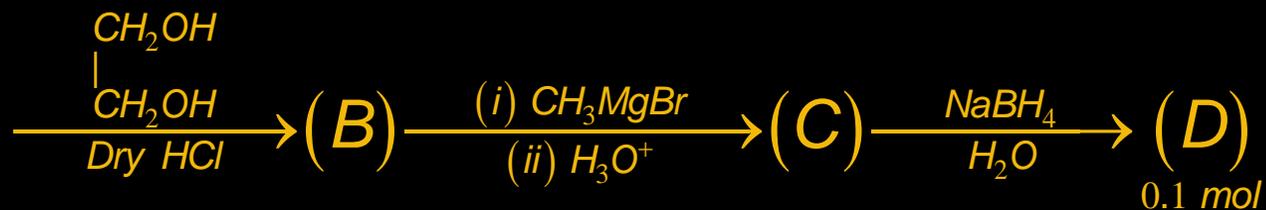
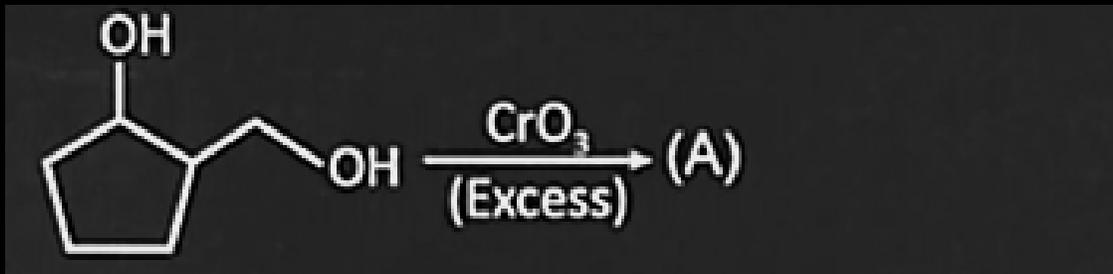


**Fig. 4.1:** Trends in melting points of transition elements



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q.** Consider the following reaction:



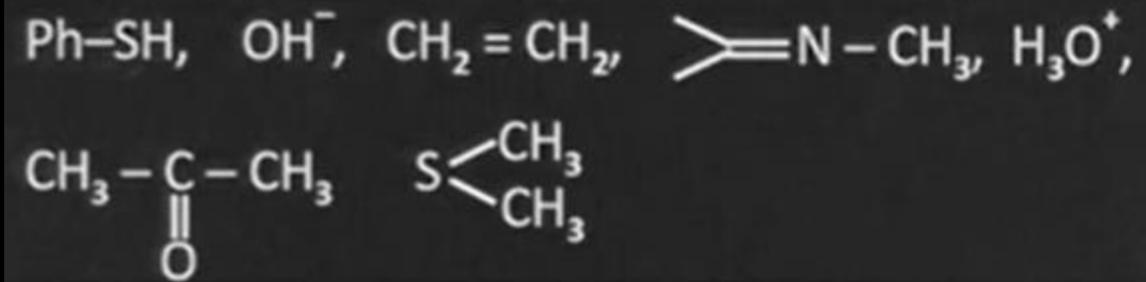
**Find the mass of final product (D) formed in gm (Nearest Integer)**

Ans. 13



# JEE MAIN 2025 LIVE PAPER DISCUSSION

#Q. How many of following can act as nucleophile



- A** 3
- B** 4
- C** 5
- D** 6

Ans. (D)



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q.** Given ionisation enthalpy of element  $E_{(g)}$  is 300 kJ/mol and electron gain enthalpy of A, B, C and D gases atoms are  $-320$  kJ/mol,  $-340$  kJ/mol,  $-200$  kJ/mol and  $-250$  kJ/mol then what will be the correct order of ionic nature of compounds?

- A**  $EC > ED > EA > EB$
- B**  $EC > ED > EB > EA$
- C**  $EB > EA > ED > EC$
- D**  $EB > EA > EC > ED$

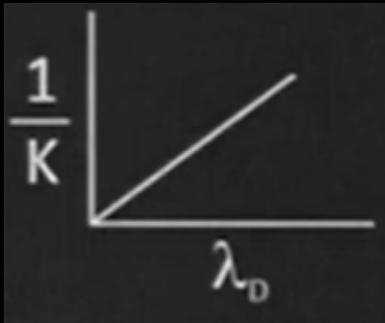
Ans. (C)



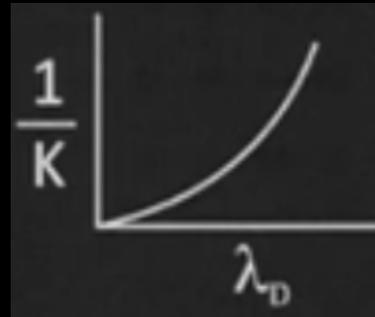
# JEE MAIN 2025 LIVE PAPER DISCUSSION

#Q. Graph between deBroglie wavelength ( $\lambda_D$ ) and kinetic energy (K) of an electron is:

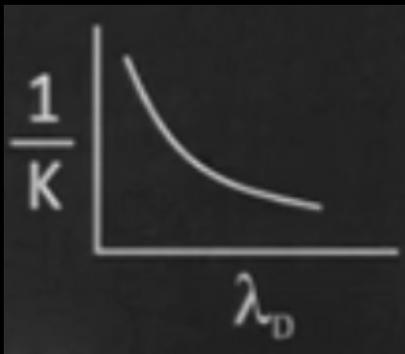
**A**



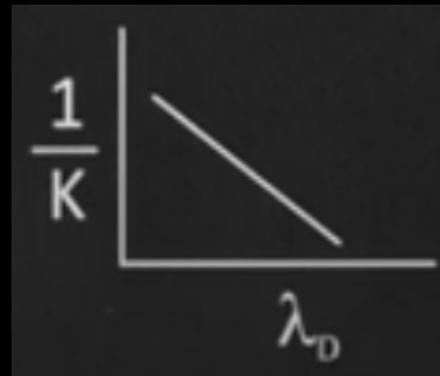
**B**



**C**



**D**



Ans. (B)



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q.** Which of the following ions is strongest oxidising agent

Given :  $E^{\circ}_{Al^{3+}/Al} = -2.7 \text{ V}$

$$E^{\circ}_{Cu^{2+}/Cu} = 0.34 \text{ V}$$

$$E^{\circ}_{Pb^{4+}/Pb^{2+}} = 1.8 \text{ V}$$

$$E^{\circ}_{Ti^{3+}/Ti} = -1.21 \text{ V}$$

**A**  $Al^{3+}$

**B**  $Cu^{2+}$

**C**  $Pb^{4+}$

**D**  $Ti^{3+}$

Ans. (C)



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q.** Consider the following reaction



If  $P$  is total pressure at equilibrium &  $K_p$  is equilibrium constant. Then  $\alpha$  in terms of  $K_p$  &  $P$  is (Assume  $\alpha \ll 1$ )

**A**  $\sqrt{\frac{K_p}{P}}$

**B**  $\sqrt[4]{\frac{K_p}{P}}$

**C**  $\sqrt{\frac{2K_p}{P}}$

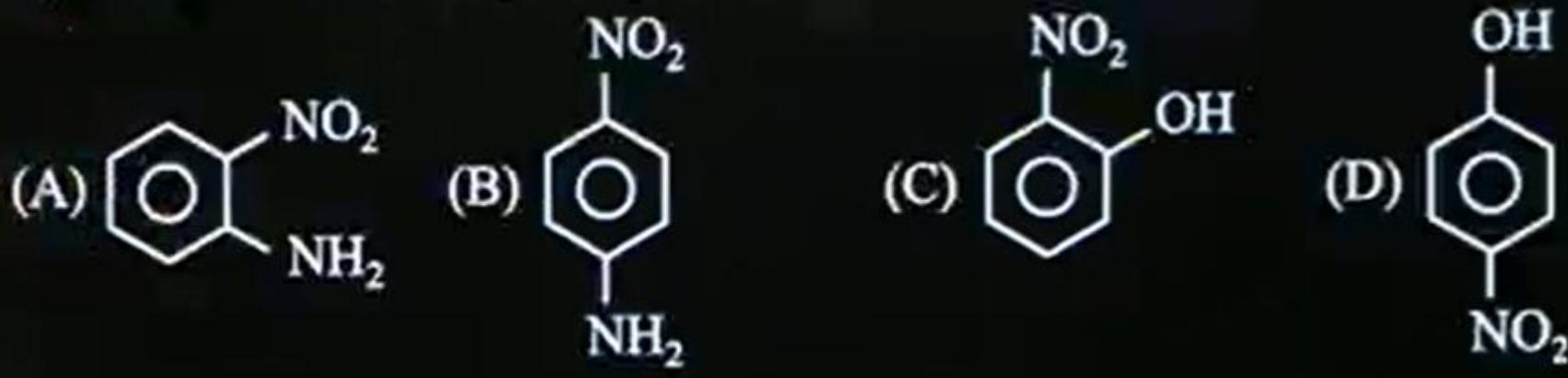
**D**  $\sqrt[3]{\frac{2K_p^2}{P}}$

Ans. (D)



# JEE MAIN 2025 LIVE PAPER DISCUSSION

#Q. Which of the following compounds are steam volatile?



**A** A & B

**B** A & C

**C** C & D

**D** B & D

Ans. (B)



# JEE MAIN 2025 LIVE PAPER DISCUSSION

**#Q.** For Strong electro light  $\Lambda_m$  is vary with  $\sqrt{c}$  for an electrolyte, then molar conductance for the same electrolyte at infinite dilution shows.

- A** Small increase
- B** Small decrease
- C** Sharp increase
- D** Sharp decrease

**Ans. (A)**