

CHEMISTRY · JEE MAIN

Hydrogen & s-Block Elements

Chapter-wise previous year questions, with answer key

103

PYQS

2020-2023

PAPERS

5

TOPICS

Alkali Metals

Alkaline Earth Metals

Hydrogen and Hydrides

Anomalous Behaviour of Li and Be

Hydrogen Peroxide

- 1 Attempt each question on paper first — they're grouped by topic, newest papers first.
- 2 Check yourself against the answer key at the end.
- 3 Got one wrong? Tap "Step-by-step solution" under it for the full working.

Stuck on a question?

Every question has a free step-by-step solution on PrepWiser — tap "Step-by-step solution" under it.

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Q1 JEE Main 2023 · 12 Apr · Shift 1

The density of alkali metals is in the order :

- (A) $\text{Na} < \text{K} < \text{Cs} < \text{Rb}$
- (B) $\text{K} < \text{Na} < \text{Rb} < \text{Cs}$
- (C) $\text{K} < \text{Cs} < \text{Na} < \text{Rb}$
- (D) $\text{Na} < \text{Rb} < \text{K} < \text{Cs}$

[Step-by-step solution ► prepwiser.in/questions/FSkTHnd1yY](https://www.prepwiser.in/questions/FSkTHnd1yY)

Q2 JEE Main 2023 · 11 Apr · Shift 2

Alkali metal from the following with least melting point is :

- | | |
|--------|--------|
| (A) Rb | (B) Na |
| (C) K | (D) Cs |

[Step-by-step solution ► prepwiser.in/questions/HhbCVIb4vx](https://www.prepwiser.in/questions/HhbCVIb4vx)

Q3 JEE Main 2023 · 10 Apr · Shift 2

Number of water molecules in washing soda and soda ash respectively are :

- | | |
|--------------|--------------|
| (A) 1 and 0 | (B) 10 and 1 |
| (C) 1 and 10 | (D) 10 and 0 |

[Step-by-step solution ► prepwiser.in/questions/o916dvNbt8](https://www.prepwiser.in/questions/o916dvNbt8)

Q4 JEE Main 2023 · 8 Apr · Shift 2

Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : Sodium is about 30 times as abundant as potassium in the oceans.

Reason R : Potassium is bigger in size than sodium.

In the light of the above statements, choose the correct answer from the options given below

- (A) Both A and R are true but R is NOT the correct explanation of A
- (B) A is false but R is true
- (C) Both A and R are true and R is the correct explanation of A
- (D) A is true but R is false

[Step-by-step solution ► prepwiser.in/questions/Y-hZSc-EYE](https://www.prepwiser.in/questions/Y-hZSc-EYE)

Q5 JEE Main 2023 · 1 Feb · Shift 2

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R)
Assertion (A) : An aqueous solution of KOH when used for volumetric analysis, its concentration should be checked before the use.

Reason (R) : On aging, KOH solution absorbs atmospheric CO_2 .

In the light of the above statements, choose the correct answer from the options given below :

- (A) (A) is correct but (R) is not correct
- (B) (A) is not correct but (R) is correct
- (C) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- (D) Both (A) and (R) are correct and (R) is the correct explanation of (A)

[Step-by-step solution ► prepwiser.in/questions/Kd6Wr02h2W](https://www.prepwiser.in/questions/Kd6Wr02h2W)

Q6 JEE Main 2023 · 29 Jan · Shift 1

The correct order of hydration enthalpies is

- (A) K^+
- (B) Rb^+
- (C) Mg^{2+}
- (D) Cs^+
- (E) Ca^{2+}

Choose the correct answer from the options given below :

- (A) $E > C > A > B > D$
- (B) $C > A > E > B > D$
- (C) $C > E > A > D > B$
- (D) $C > E > A > B > D$

[Step-by-step solution ► prepwiser.in/questions/60Z0NvAEIE](https://www.prepwiser.in/questions/60Z0NvAEIE)

Q7 JEE Main 2023 · 29 Jan · Shift 1

The magnetic behaviour of Li_2O , Na_2O_2 and KO_2 , respectively, are :

- (A) paramagnetic, paramagnetic and diamagnetic
- (B) paramagnetic, diamagnetic and paramagnetic
- (C) diamagnetic, paramagnetic and diamagnetic
- (D) diamagnetic, diamagnetic and paramagnetic

[Step-by-step solution ► prepwiser.in/questions/Nbqlyzc_tG](https://www.prepwiser.in/questions/Nbqlyzc_tG)

Q8 JEE Main 2023 · 29 Jan · Shift 2

On heating, LiNO_3 gives how many compounds among the following _____

Li_2O , N_2 , O_2 , LiNO_2 , NO_2

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/6Wv1hAePjk](https://www.prepwiser.in/questions/6Wv1hAePjk)

Q9 JEE Main 2023 · 25 Jan · Shift 2

Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : The alkali metals and their salts impart characteristic colour to reducing flame.

Reason R : Alkali metals can be detected using flame tests.

In the light of the above statements, choose the most appropriate answer from the options given below :

- (A) A is not correct but R is correct
- (B) A is correct but R is not correct
- (C) Both A and R are correct and R is the correct explanation of A
- (D) Both A and R are correct but R is NOT the correct explanation of A

[Step-by-step solution ► prepwiser.in/questions/TKV9uGBaZ0](https://www.prepwiser.in/questions/TKV9uGBaZ0)

Q10 JEE Main 2023 · 25 Jan · Shift 1

Compound A reacts with NH_4Cl and forms a compound B. Compound B reacts with H_2O and excess of CO_2 to form compound C which on passing through or reaction with saturated NaCl solution forms sodium hydrogen carbonate. Compound A, B and C, are respectively :

- (A) $\text{Ca}(\text{OH})_2$, NH_4^+ , $(\text{NH}_4)_2\text{CO}_3$
- (B) CaCl_2 , NH_4^+ , $(\text{NH}_4)_2\text{CO}_3$
- (C) CaCl_2 , NH_3 , NH_4HCO_3
- (D) $\text{Ca}(\text{OH})_2$, NH_3 , NH_4HCO_3

[Step-by-step solution ► prepwiser.in/questions/ee4sHuuJlI](https://www.prepwiser.in/questions/ee4sHuuJlI)

Q11 JEE Main 2023 · 24 Jan · Shift 2

Identify the correct statements about alkali metals.

- A. The order of standard reduction potential ($\text{M}^+ \mid \text{M}$) for alkali metal ions is $\text{Na} > \text{Rb} > \text{Li}$.
- B. CsI is highly soluble in water.
- C. Lithium carbonate is highly stable to heat.
- D. Potassium dissolved in concentrated liquid ammonia is blue in colour and paramagnetic.
- E. All the alkali metal hydrides are ionic solids.

Choose the correct answer from the options given below :

- (A) C and E only
- (B) A and E only
- (C) A, B, D only
- (D) A, B and E only

[Step-by-step solution ► prepwiser.in/questions/2oPW21R-2y](https://www.prepwiser.in/questions/2oPW21R-2y)

Q12 JEE Main 2022 · 29 Jul · Shift 1

Lithium nitrate and sodium nitrate, when heated separately, respectively, give :

- (A) LiNO_2 and NaNO_2
- (B) Li_2O and Na_2O
- (C) Li_2O and NaNO_2
- (D) LiNO_2 and Na_2O

[Step-by-step solution ► prepwiser.in/questions/b4x6Sk2VAt](https://www.prepwiser.in/questions/b4x6Sk2VAt)

Q13 JEE Main 2022 · 25 Jul · Shift 1

Choose the correct order of density of the alkali metals :

- (A) $\text{Li} < \text{K} < \text{Na} < \text{Rb} < \text{Cs}$
- (B) $\text{Li} < \text{Na} < \text{K} < \text{Rb} < \text{Cs}$
- (C) $\text{Cs} < \text{Rb} < \text{K} < \text{Na} < \text{Li}$
- (D) $\text{Li} < \text{Na} < \text{K} < \text{Cs} < \text{Rb}$

[Step-by-step solution ► prepwiser.in/questions/eCo_52gt5x](https://www.prepwiser.in/questions/eCo_52gt5x)

Q14 JEE Main 2022 · 30 Jun · Shift 1

Correct statement about alkali metal oxides is :

- (A) peroxides are colored.
- (B) superoxides are paramagnetic.
- (C) oxides are paramagnetic.
- (D) peroxides are both colored and paramagnetic.

[Step-by-step solution ► prepwiser.in/questions/UU53Izgtu](https://www.prepwiser.in/questions/UU53Izgtu)

Q15 JEE Main 2022 · 29 Jun · Shift 2

Amongst baking soda, caustic soda and washing soda, carbonate anion is present in :

- (A) washing soda only.
- (B) washing soda and caustic soda only.
- (C) washing soda and baking soda only.
- (D) baking soda, caustic soda and washing soda.

[Step-by-step solution ► prepwiser.in/questions/mmU5AMMYhy](https://www.prepwiser.in/questions/mmU5AMMYhy)

Q16 JEE Main 2021 · 1 Sep · Shift 2

Number of paramagnetic oxides among the following given oxides is _____.

Li_2O , CaO , Na_2O_2 , KO_2 , MgO and K_2O

- | | |
|-------|-------|
| (A) 1 | (B) 2 |
| (C) 3 | (D) 0 |

[Step-by-step solution ► prepwiser.in/questions/dXFUof5P_s](https://www.prepwiser.in/questions/dXFUof5P_s)

Q17 JEE Main 2021 · 20 Jul · Shift 2

Metallic sodium does not react normally with :

- | | |
|---------------------|------------------------|
| (A) gaseous ammonia | (B) But-2-yne |
| (C) Ethyne | (D) tert-butyl alcohol |

[Step-by-step solution ► prepwiser.in/questions/QDWOxNnqBe](https://www.prepwiser.in/questions/QDWOxNnqBe)

Q18 JEE Main 2021 · 17 Mar · Shift 2

One of the by-products formed during the recovery of NH_3 from Solvay process is :

- (A) $\text{Ca}(\text{OH})_2$
- (B) NH_4Cl
- (C) NaHCO_3
- (D) CaCl_2

[Step-by-step solution ► prepwiser.in/questions/2IvRUsi5cy](https://www.prepwiser.in/questions/2IvRUsi5cy)

Q19 JEE Main 2021 · 25 Feb · Shift 2

Among the following, number of metal/s which can be used as electrodes in the photoelectric cell is _____. (Integer answer)

- (A) Li
- (B) Na
- (C) Rb
- (D) Cs

Numerical answer — enter the value.

[Step-by-step solution ► prepwiser.in/questions/beskAXrez9](https://www.prepwiser.in/questions/beskAXrez9)

Q20 JEE Main 2021 · 24 Feb · Shift 2

Match List - I with List - II.

List I (Salt)	List II (Flame colour wavelength)
(a) LiCl	(i) 455.5 nm
(b) NaCl	(ii) 670.8 nm
(c) RbCl	(iii) 780.0 nm
(d) CsCl	(iv) 589.2 nm

Choose the correct answer from the options given below :

- (A) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)
- (B) (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)
- (C) (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)
- (D) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

[Step-by-step solution ► prepwiser.in/questions/4EROqJIY9B](https://www.prepwiser.in/questions/4EROqJIY9B)

Q21 JEE Main 2020 · 4 Sep · Shift 1

On combustion of Li, Na and K in excess of air, the major oxides formed, respectively, are :

- (A) Li_2O , Na_2O_2 and K_2O
- (B) Li_2O_2 , Na_2O_2 and K_2O_2
- (C) Li_2O , Na_2O_2 and KO_2
- (D) Li_2O , Na_2O and K_2O_2

[Step-by-step solution ► prepwisser.in/questions/JdWlkhdV40](https://www.prepwisser.in/questions/JdWlkhdV40)

Q22 JEE Main 2020 · 2 Sep · Shift 1

The metal mainly used in devising photoelectric cells is :

- (A) Na
- (B) Rb
- (C) Li
- (D) Cs

[Step-by-step solution ► prepwisser.in/questions/Kbnnl2Vbqf](https://www.prepwisser.in/questions/Kbnnl2Vbqf)

Alkaline Earth Metals · 24 PYQs

Q23 JEE Main 2023 · 13 Apr · Shift 2

Better method for preparation of BeF_2 , among the following is :

- (A) $\text{BeH}_2 + \text{F}_2 \xrightarrow{\Delta} \text{BeF}_2$
- (B) $(\text{NH}_4)_2\text{BeF}_4 \xrightarrow{\Delta} \text{BeF}_2$
- (C) $\text{Be} + \text{F}_2 \xrightarrow{\Delta} \text{BeF}_2$
- (D) $\text{BeO} + \text{C} + \text{F}_2 \xrightarrow{\Delta} \text{BeF}_2$

[Step-by-step solution ► prepwisser.in/questions/kN8yOBtCpz](https://www.prepwisser.in/questions/kN8yOBtCpz)

Q24 JEE Main 2023 · 11 Apr · Shift 2

$\text{Mg}(\text{NO}_3)_2 \cdot \text{XH}_2\text{O}$ and $\text{Ba}(\text{NO}_3)_2 \cdot \text{YH}_2\text{O}$, represent formula of the crystalline forms of nitrate salts. Sum of X and Y is _____.

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/f0vhIV0gWi](https://www.prepwisser.in/questions/f0vhIV0gWi)

Q25 JEE Main 2023 · 10 Apr · Shift 1

Lime reacts exothermally with water to give 'A' which has low solubility in water. Aqueous solution of 'A' is often used for the test of CO_2 , a test in which insoluble B is formed. If B is further reacted with CO_2 then soluble compound is formed, 'A' is :

- (A) Quick lime
- (B) White lime
- (C) Lime water
- (D) Slaked lime

[Step-by-step solution ► prepwisser.in/questions/i2tXYrR-9y](https://www.prepwisser.in/questions/i2tXYrR-9y)

Q26 JEE Main 2023 · 8 Apr · Shift 1

What is the purpose of adding gypsum to cement?

- (A) To facilitate the hydration of cement
(B) To speed up the process of setting
(C) To give a hard mass
(D) To slow down the process of setting

Step-by-step solution ► prepwisar.in/questions/U10iH2TGIG

Q27 JEE Main 2023 · 6 Apr · Shift 1

The setting time of Cement is increased by adding :

- (A) Gypsum
(B) Limestone
(C) Clay
(D) Silica

Step-by-step solution ► prepwisar.in/questions/QE_M7SqIDj

Q28 JEE Main 2023 · 6 Apr · Shift 2

Ion having highest hydration enthalpy among the given alkaline earth metal ions is :

- (A) Sr^{2+}
(B) Ca^{2+}
(C) Be^{2+}
(D) Ba^{2+}

Step-by-step solution ► prepwisar.in/questions/Q5tTQ7zw2M

Q29 JEE Main 2023 · 1 Feb · Shift 2

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Gypsum is used for making fireproof wall boards.

Reason (R) : Gypsum is unstable at high temperatures.

In the light of the above statements, choose the correct answer from the options given below :

- (A) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
(B) Both (A) and (R) are correct and (R) is the correct explanation of (A)
(C) (A) is correct but (R) is not correct
(D) (A) is not correct but (R) is correct

Step-by-step solution ► prepwisar.in/questions/kx5Q70EwNc

Q30 JEE Main 2023 · 31 Jan · Shift 2

The element playing significant role in neuromuscular function and interneuronal transmission is :

- (A) Be
(B) Ca
(C) Mg
(D) Li

Step-by-step solution ► prepwisar.in/questions/ZTQKdMxh7C

Q31 JEE Main 2023 · 30 Jan · Shift 1

The alkaline earth metal sulphate(s) which are readily soluble in water is/are :

- A. BeSO_4
- B. MgSO_4
- C. CaSO_4
- D. SrSO_4
- E. BaSO_4

Choose the correct answer from the options given below :

- (A) A and B
- (B) B and C
- (C) B only
- (D) A only

[Step-by-step solution ► prepwisser.in/questions/kicT7IXVOA](https://www.prepwisser.in/questions/kicT7IXVOA)

Q32 JEE Main 2022 · 29 Jul · Shift 2

Portland cement contains 'X' to enhance the setting time. What is 'X'?

- (A) $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$
- (B) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
- (C) CaSO_4
- (D) CaCO_3

[Step-by-step solution ► prepwisser.in/questions/uHvbrb3xn1](https://www.prepwisser.in/questions/uHvbrb3xn1)

Q33 JEE Main 2022 · 28 Jul · Shift 2

The products obtained during treatment of hard water using Clark's method are :

- (A) CaCO_3 and MgCO_3
- (B) Ca(OH)_2 and Mg(OH)_2
- (C) CaCO_3 and Mg(OH)_2
- (D) Ca(OH)_2 and MgCO_3

[Step-by-step solution ► prepwisser.in/questions/8-EAWfx0G4](https://www.prepwisser.in/questions/8-EAWfx0G4)

Q34 JEE Main 2022 · 25 Jun · Shift 1

Which one of the following alkaline earth metal ions has the highest ionic mobility in its aqueous solution?

- (A) Be^{2+}
- (B) Mg^{2+}
- (C) Ca^{2+}
- (D) Sr^{2+}

[Step-by-step solution ► prepwisser.in/questions/1o5TBBty09](https://www.prepwisser.in/questions/1o5TBBty09)

Q35 JEE Main 2021 · 27 Aug · Shift 1

The number of water molecules in gypsum, dead burnt plaster and plaster of Paris, respectively are :

- (A) 2, 0 and 1
- (B) 0.5, 0 and 2
- (C) 5, 0 and 0.5
- (D) 2, 0 and 0.5

[Step-by-step solution ► prepwisser.in/questions/7qRtL6qJw5](https://www.prepwisser.in/questions/7qRtL6qJw5)

Q36 JEE Main 2021 · 26 Aug · Shift 2

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Barium carbonate is insoluble in water and is highly stable.

Reason (R) : The thermal stability of the carbonates increases with increasing cationic size.

- (A) Both (A) and (R) are true and (R) is the true explanation of (A)
- (B) (A) is true but (R) is false
- (C) Both (A) and (R) are true but (R) is not the true explanation of (A)
- (D) (A) is false but (R) is true.

Step-by-step solution ► [prepwiser.in/questions/mSZ-LI1rKw](https://www.prepwiser.in/questions/mSZ-LI1rKw)

Q37 JEE Main 2021 · 26 Aug · Shift 1

What are the products formed in sequence when excess of CO_2 is passed in slaked lime?

- (A) $\text{Ca}(\text{HCO}_3)_2$, CaCO_3
- (B) CaCO_3 , $\text{Ca}(\text{HCO}_3)_2$
- (C) CaO , $\text{Ca}(\text{HCO}_3)_2$
- (D) CaO , CaCO_3

Step-by-step solution ► [prepwiser.in/questions/FnbtJ_Mf3i](https://www.prepwiser.in/questions/FnbtJ_Mf3i)

Q38 JEE Main 2021 · 25 Jul · Shift 1

Given below are two statements :

Statement I : None of the alkaline earth metal hydroxides dissolve in alkali.

Statement II : Solubility of alkaline earth metal hydroxides in water increases down the group.

In the light of the above statements, choose the most appropriate answer from the options given below :

- (A) Statement I is correct but Statement II is incorrect.
- (B) Statement I is incorrect but Statement II is correct.
- (C) Statement I and Statement II both are incorrect.
- (D) Statement I and Statement II both are correct.

Step-by-step solution ► [prepwiser.in/questions/2Qg1JNdLnM](https://www.prepwiser.in/questions/2Qg1JNdLnM)

Match List-I with List-II

List-I (Elements)	List-II (Properties)
(a) Ba	(i) Organic solvent soluble compounds
(b) Ca	(ii) Outer electronic configuration $6s^2$
(c) Li	(iii) Oxalate insoluble in water
(d) Na	(iv) Formation of very strong monoacidic base

Choose the correct answer from the options given below :

(A) (a)-(ii), (b)-(iii), (c)-(i) and (d)-(iv)**(B)** (a)-(iv), (b)-(i), (c)-(ii) and (d)-(iii)**(C)** (a)-(iii), (b)-(ii), (c)-(iv) and (d)-(i)**(D)** (a)-(i), (b)-(iv), (c)-(ii) and (d)-(iii)Step-by-step solution ► [prepwiser.in/questions/qZY7sa1Hcj](https://www.prepwiser.in/questions/qZY7sa1Hcj)

Match List - I with List - II :

List - I	List - II
(a) Be	(i) treatment of cancer
(b) Mg	(ii) extraction of metals
(c) Ca	(iii) incendiary bombs and signals
(d) Ra	(iv) windows of X-ray tubes
	(v) bearings for motor engines

Choose the most appropriate answer from the option given below :

(A) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)**(B)** (a)-(iii), (b)-(iv), (c)-(v), (d)-(ii)**(C)** (a)-(iii), (b)-(iv), (c)-(ii), (d)-(v)**(D)** (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)Step-by-step solution ► [prepwiser.in/questions/LEozkO3eGG](https://www.prepwiser.in/questions/LEozkO3eGG)

Match List - I with List - II

List - I

List - II

- | | |
|------------------------------------|-----------------------|
| (a) $Ca(OCl)_2$ | (i) Antacid |
| (b) $CaSO_4 \cdot \frac{1}{2}H_2O$ | (ii) Cement |
| (c) CaO | (iii) Bleach |
| (d) $CaCO_3$ | (iv) Plaster of paris |

Choose the most appropriate answer from the options given below :

(A) (a) - (i), (b) - (iv), (c) - (iii), (d) - (ii)

(B) (a) - (iii), (b) - (ii), (c) - (iv), (d) - (i)

(C) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)

(D) (a) - (iii), (b) - (ii), (c) - (i), (d) - (iv)

Step-by-step solution ► [prepwiser.in/questions/stjfaMIIf0](https://www.prepwiser.in/questions/stjfaMIIf0)

Number of amphoteric compounds among the following is _____.

(A) BeO

(B) BaO

(C) $Be(OH)_2$

(D) $Sr(OH)_2$

Numerical answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/zqtpb5AJbm](https://www.prepwiser.in/questions/zqtpb5AJbm)

Among the sulphates of alkaline earth metals, the solubilities of $BeSO_4$ and $MgSO_4$ in water, respectively, are :

(A) poor and poor

(B) poor and high

(C) high and poor

(D) high and high

Step-by-step solution ► [prepwiser.in/questions/L7jQXUXkei](https://www.prepwiser.in/questions/L7jQXUXkei)

Two elements A and B have similar chemical properties. They don't form solid hydrogencarbonates, but react with nitrogen to form nitrides. A and B, respectively, are :

(A) Li and Mg

(B) Cs and Ba

(C) Na and Rb

(D) Na and Ca

Step-by-step solution ► [prepwiser.in/questions/CPesmGO0fl](https://www.prepwiser.in/questions/CPesmGO0fl)

Q45 JEE Main 2020 · 8 Jan · Shift 1

When gypsum is heated to 393 K, it forms :

- (A) $\text{CaSO}_4 \cdot 0.5\text{H}_2\text{O}$
- (B) $\text{CaSO}_4 \cdot 5\text{H}_2\text{O}$
- (C) Dead burnt plaster
- (D) Anhydrous CaSO_4

[Step-by-step solution ► prepwisser.in/questions/aCbf30035W](https://www.prepwisser.in/questions/aCbf30035W)

Q46 JEE Main 2020 · 8 Jan · Shift 2

A metal (A) on heating in nitrogen gas gives compound B. B on treatment with H_2O gives a colourless gas which when passed through CuSO_4 solution gives a dark blue-violet coloured solution. A and B respectively, are :

- (A) Na and NaNO_3
- (B) Na and Na_3N
- (C) Mg and Mg_3N_2
- (D) Mg and $\text{Mg}(\text{NO}_3)_2$

[Step-by-step solution ► prepwisser.in/questions/7XG4D4s_K2](https://www.prepwisser.in/questions/7XG4D4s_K2)

Hydrogen and Hydrides · 22 PYQs

Q47 JEE Main 2023 · 13 Apr · Shift 2

Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : Isotopes of hydrogen have almost same chemical properties, but difference in their rates of reaction.

Reason R : Isotopes of hydrogen have different enthalpy of bond dissociation.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (A) A is not correct but R is correct
- (B) Both A and R are correct but R is NOT the correct explanation of A
- (C) A is correct but R is not correct
- (D) Both A and R are correct and R is the correct explanation of A

[Step-by-step solution ► prepwisser.in/questions/sEULt9rIHl](https://www.prepwisser.in/questions/sEULt9rIHl)

Q48 JEE Main 2023 · 11 Apr · Shift 2

Which hydride among the following is less stable?

- (A) NH_3
- (B) HF
- (C) LiH
- (D) BeH_2

[Step-by-step solution ► prepwisser.in/questions/RwC8vLwOzo](https://www.prepwisser.in/questions/RwC8vLwOzo)

Q49 JEE Main 2023 · 10 Apr · Shift 2

Given below are two statements: one is labelled as Assertion **A** and the other is labelled as Reason **R**.

Assertion **A** : Physical properties of isotopes of hydrogen are different.

Reason **R** : Mass difference between isotopes of hydrogen is very large.

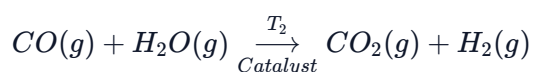
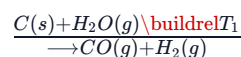
In the light of the above statements, choose the correct answer from the options given below:

- (A) **A** is true but **R** is false
- (B) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
- (C) **A** is false but **R** is true
- (D) Both **A** and **R** are true and **R** is the correct explanation of **A**

[Step-by-step solution ► prepwiser.in/questions/z-wOeR84_5](https://www.prepwiser.in/questions/z-wOeR84_5)

Q50 JEE Main 2023 · 10 Apr · Shift 1

Given below are two reactions, involved in the commercial production of dihydrogen (H_2). The two reactions are carried out at temperature " T_1 " and " T_2 ", respectively



The temperatures T_1 and T_2 are correctly related as :

- (A) $T_1 < T_2$
- (B) $T_1 = T_2$
- (C) $T_1 = 100\text{ K}$, $T_2 = 1270\text{ K}$
- (D) $T_1 > T_2$

[Step-by-step solution ► prepwiser.in/questions/_VraYnbiOj](https://www.prepwiser.in/questions/_VraYnbiOj)

Q51 JEE Main 2023 · 1 Feb · Shift 1

Given below are two statements : one is labelled as Assertion **A** and the other is labelled as Reason **R**.

Assertion **A** : Hydrogen is an environment friendly fuel.

Reason **R** : Atomic number of hydrogen is 1 and it is a very light element.

In the light of the above statements, choose the correct answer from the options given below :

- (A) Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
- (B) **A** is false but **R** is true
- (C) **A** is true but **R** is false
- (D) Both **A** and **R** are true and **R** is the correct explanation of **A**

[Step-by-step solution ► prepwiser.in/questions/q2Mdd2vb_](https://www.prepwiser.in/questions/q2Mdd2vb_)

Q52 JEE Main 2023 · 30 Jan · Shift 1

Lithium aluminium hydride can be prepared from the reaction of :

- (A) $LiCl$ and Al_2H_6
- (B) LiH and $Al(OH)_3$
- (C) LiH and Al_2Cl_6
- (D) $LiCl$, Al and H_2

[Step-by-step solution ► prepwiser.in/questions/9s_ezLwrrk](https://www.prepwiser.in/questions/9s_ezLwrrk)

Q53 JEE Main 2023 · 29 Jan · Shift 1

Which of the given compounds can enhance the efficiency of hydrogen storage tank?

- (A) SiH_4 (B) Li/P_4
(C) NaNi_5 (D) Di-isobutylaluminium hydride

Step-by-step solution ► [prepwisser.in/questions/8w2Yjsyvow](https://www.prepwisser.in/questions/8w2Yjsyvow)

Q54 JEE Main 2022 · 25 Jul · Shift 2

High purity (> 99.95%) dihydrogen is obtained by :

- (A) reaction of zinc with aqueous alkali.
(B) electrolysis of acidified water using platinum electrodes.
(C) electrolysis of warm aqueous barium hydroxide solution between nickel electrodes.
(D) reaction of zinc with dilute acid.

Step-by-step solution ► [prepwisser.in/questions/-p_GbRJ6Z-](https://www.prepwisser.in/questions/-p_GbRJ6Z-)

Q55 JEE Main 2022 · 28 Jun · Shift 2

Hydrogen has three isotopes : protium (^1H), deuterium (^2H or D) and tritium (^3H or T). They have nearly same chemical properties but different physical properties. They differ in :

- (A) number of protons. (B) atomic number.
(C) electronic configuration. (D) atomic mass.

Step-by-step solution ► [prepwisser.in/questions/o27LMn57RD](https://www.prepwisser.in/questions/o27LMn57RD)

Q56 JEE Main 2022 · 28 Jun · Shift 1

Dihydrogen reacts with CuO to give :

- (A) CuH_2
(B) Cu
(C) Cu_2O
(D) $\text{Cu}(\text{OH})_2$

Step-by-step solution ► [prepwisser.in/questions/uY8n9lxjvr](https://www.prepwisser.in/questions/uY8n9lxjvr)

Q57 JEE Main 2022 · 27 Jun · Shift 1

BeCl_2 reacts with LiAlH_4 to give :

- (A) $\text{Be} + \text{Li}[\text{AlCl}_4] + \text{H}_2$
(B) $\text{Be} + \text{AlH}_3 + \text{LiCl} + \text{HCl}$
(C) $\text{BeH}_2 + \text{LiCl} + \text{AlCl}_3$
(D) $\text{BeH}_2 + \text{Li}[\text{AlCl}_4]$

Step-by-step solution ► [prepwisser.in/questions/NS9wc2BpZx](https://www.prepwisser.in/questions/NS9wc2BpZx)

Q58 JEE Main 2022 · 24 Jun · Shift 1

The highest industrial consumption of molecular hydrogen is to produce compounds of element :

- (A) Carbon (B) Nitrogen
(C) Oxygen (D) Chlorine

Step-by-step solution ► [prepwisser.in/questions/HvKihyYgAY](https://www.prepwisser.in/questions/HvKihyYgAY)

Q59 JEE Main 2021 · 27 Aug · Shift 1

Deuterium resembles hydrogen in properties but :

- (A) reacts slower than hydrogen
- (B) reacts vigorously than hydrogen
- (C) reacts just as hydrogen
- (D) emits β^+ particles

[Step-by-step solution ► prepwiser.in/questions/xwRuQ1DG-i](https://www.prepwiser.in/questions/xwRuQ1DG-i)

Q60 JEE Main 2021 · 26 Aug · Shift 2

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Heavy water is used for the study of reaction mechanism.

Reason (R) : The rate of reaction for the cleavage of O - H bond is slower than that of O - D bond.

Choose the most appropriate answer from the options given below :

- (A) Both (A) and (R) are true but (R) is not the true explanation of (A).
- (B) Both (A) and (R) are true and (R) is the true explanation of (A).
- (C) (A) is false but (R) is true.
- (D) (A) is true but (R) is false.

[Step-by-step solution ► prepwiser.in/questions/qvKZzi7qSU](https://www.prepwiser.in/questions/qvKZzi7qSU)

Q61 JEE Main 2021 · 25 Jul · Shift 2

Which one of the following metals forms interstitial hydride easily?

- | | |
|--------|--------|
| (A) Cr | (B) Fe |
| (C) Mn | (D) Co |

[Step-by-step solution ► prepwiser.in/questions/IC-UlzHPK7](https://www.prepwiser.in/questions/IC-UlzHPK7)

Q62 JEE Main 2021 · 20 Jul · Shift 2

The single largest industrial application of dihydrogen is :

- | | |
|-----------------------------------|-------------------------------------|
| (A) Manufacture of metal hydrides | (B) Rocket fuel in space research |
| (C) In the synthesis of ammonia | (D) In the synthesis of nitric acid |

[Step-by-step solution ► prepwiser.in/questions/JfujjO6Pz6](https://www.prepwiser.in/questions/JfujjO6Pz6)

The INCORRECT statement(s) about heavy water is (are)

- (A) used as a moderator in nuclear reactor
- (B) obtained as a by-product in fertilizer industry
- (C) used for the study of reaction mechanism
- (D) has a higher dielectric constant than water

Choose the correct answer from the options given below :

- (A) (D) only
- (B) (B) and (D) only
- (C) (B) only
- (D) (C) only

[Step-by-step solution ► prepwiser.in/questions/5W_UlcdIzt](https://www.prepwiser.in/questions/5W_UlcdIzt)

Statements about heavy water are given below :

- A. Heavy water is used in exchange reactions for the study of reaction mechanisms.
- B. Heavy water is prepared by exhaustive electrolysis of water.
- (C) Heavy water has higher boiling point than ordinary water.
- (D) Viscosity of H_2O is greater than D_2O .

Choose the most appropriate answer from the options given below :

- (A) A, B, and C only
- (B) A and C only
- (C) A and D only
- (D) A and B only

[Step-by-step solution ► prepwiser.in/questions/4p_A3vhQjh](https://www.prepwiser.in/questions/4p_A3vhQjh)

Q65 JEE Main 2021 · 24 Feb · Shift 2

Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A : Hydrogen is the most abundant element in the Universe, but it is not the most abundant gas in the troposphere.

Reason R : Hydrogen is the lightest element.

In the light of the above statements, choose the correct answer from the options given below :

- (A) Both A and R are true but R is NOT the correct explanation of A
- (B) Both A and R are true and R is the correct explanation of A
- (C) A is true but R is false
- (D) A is false but R is true.

Step-by-step solution ► [prepwiser.in/questions/HuTQXbjTBY](https://www.prepwiser.in/questions/HuTQXbjTBY)

Q66 JEE Main 2020 · 6 Sep · Shift 2

Dihydrogen of high purity (> 99.95%) is obtained through :

- (A) the electrolysis of acidified water using Pt electrodes
- (B) the electrolysis of warm Ba(OH)_2 solution using Ni electrodes
- (C) the electrolysis of brine solution
- (D) the reaction of Zn with dilute HCl

Step-by-step solution ► [prepwiser.in/questions/L_QjXMsw0u](https://www.prepwiser.in/questions/L_QjXMsw0u)

Q67 JEE Main 2020 · 5 Sep · Shift 1

The equation that represents the water-gas shift reaction is :

- (A) $\text{CO(g)} + \text{H}_2\text{O(g)} \xrightarrow[\text{Catalyst}]{673\text{K}} \text{CO}_2\text{(g)} + \text{H}_2\text{(g)}$
- (B) $\text{CH}_4\text{(g)} + \text{H}_2\text{O(g)} \xrightarrow[\text{Ni}]{1270\text{K}} \text{CO(g)} + 3\text{H}_2\text{(g)}$
- (C) $\text{C(s)} + \text{H}_2\text{O(g)} \xrightarrow{\text{buildrel}{1270\text{K}}} \text{CO(g)} + \text{H}_2\text{(g)}$
- (D) $2\text{C(s)} + \text{O}_2\text{(g)} + 4\text{N}_2\text{(g)} \xrightarrow{\text{buildrel}{1273\text{K}}} 2\text{CO(g)} + 4\text{N}_2\text{(g)}$

Step-by-step solution ► [prepwiser.in/questions/pTczIeQ7S7](https://www.prepwiser.in/questions/pTczIeQ7S7)

Q68 JEE Main 2020 · 8 Jan · Shift 2

Hydrogen has three isotopes (A), (B) and (C). If the number of neutron(s) in (A), (B) and (C) respectively, are (x), (y) and (z), the sum of (x), (y) and (z) is :

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

Step-by-step solution ► [prepwiser.in/questions/vU5tqp2ueH](https://www.prepwiser.in/questions/vU5tqp2ueH)

Q69 JEE Main 2023 · 15 Apr · Shift 1

Given below are two statements : One is labelled as Assertion A and the other is labelled as Reason R :

Assertion (A) : BeCl_2 and MgCl_2 produce characteristic flame

Reason (R) : The excitation energy is high in BeCl_2 and MgCl_2

In the light of the above statements, choose the correct answer from the options given below :

- (A) (A) is true but (R) is false
- (B) Both (A) and (R) are true and (R) is the correct explanation of (A)
- (C) (A) is false but (R) is true
- (D) Both (A) and (R) are true but (R) is NOT the correct explanation of (A)

[Step-by-step solution ► prepwiser.in/questions/7Lvq3o_asl](https://www.prepwiser.in/questions/7Lvq3o_asl)

Q70 JEE Main 2023 · 13 Apr · Shift 1

$\text{Be}(\text{OH})_2$ reacts with $\text{Sr}(\text{OH})_2$ to yield an ionic salt.

Choose the incorrect option related to this reaction from the following :

- (A) Be is tetrahedrally coordinated in the ionic salt.
- (B) The element Be is present in the cationic part of the ionic salt.
- (C) Both Sr and Be elements are present in the ionic salt.
- (D) The reaction is an example of acid - base neutralization reaction.

[Step-by-step solution ► prepwiser.in/questions/n3xa6iDjvU](https://www.prepwiser.in/questions/n3xa6iDjvU)

Q71 JEE Main 2023 · 8 Apr · Shift 1

Given below are two statements:

Statement I : Lithium and Magnesium do not form superoxide

Statement II : The ionic radius of Li^+ is larger than ionic radius of Mg^{2+}

In the light of the above statements, choose the most appropriate answer from the options given below :

- (A) Statement I is incorrect but Statement II is correct
- (B) Both Statement I and Statement II are incorrect
- (C) Both Statement I and Statement II are correct
- (D) Statement I is correct but Statement II is incorrect

[Step-by-step solution ► prepwiser.in/questions/8FIuoqW_Fd](https://www.prepwiser.in/questions/8FIuoqW_Fd)

Q72 JEE Main 2023 · 1 Feb · Shift 1

Choose the correct statement(s) :

- A. Beryllium oxide is purely acidic in nature.
- B. Beryllium carbonate is kept in the atmosphere of CO_2 .
- C. Beryllium sulphate is readily soluble in water.
- D. Beryllium shows anomalous behaviour.

Choose the correct answer from the options given below :

- (A) A only
- (B) B, C and D only
- (C) A, B and C only
- (D) A and B only

[Step-by-step solution ► prepwisser.in/questions/rqQ_qpffuU](https://www.prepwisser.in/questions/rqQ_qpffuU)

Q73 JEE Main 2023 · 30 Jan · Shift 2

Chlorides of which metal are soluble in organic solvents :

- (A) K
- (B) Be
- (C) Ca
- (D) Mg

[Step-by-step solution ► prepwisser.in/questions/UF0msDo790](https://www.prepwisser.in/questions/UF0msDo790)

Q74 JEE Main 2023 · 24 Jan · Shift 2

Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R
Assertion A : Beryllium has less negative value of reduction potential compared to the other alkaline earth metals.

Reason R : Beryllium has large hydration energy due to small size of Be^{2+} but relatively large value of atomization enthalpy

In the light of the above statements, choose the most appropriate answer from the options given below :

- (A) Both A and R are correct but R is NOT the correct explanation of A
- (B) Both A and R are correct and R is the correct explanation of A
- (C) A is correct but R is not correct
- (D) A is not correct but R is correct

[Step-by-step solution ► prepwisser.in/questions/IYbWzMAHIM](https://www.prepwisser.in/questions/IYbWzMAHIM)

Q75 JEE Main 2023 · 24 Jan · Shift 1

Reaction of BeO with ammonia and hydrogen fluoride gives A which on thermal decomposition gives BeF_2 and NH_4F . What is 'A'?

- (A) $(\text{NH}_4)\text{Be}_2\text{F}_5$
- (B) $(\text{NH}_4)_2\text{BeF}_4$
- (C) $(\text{NH}_4)\text{BeF}_3$
- (D) H_3NBeF_3

[Step-by-step solution ► prepwisser.in/questions/YnuGfei104](https://www.prepwisser.in/questions/YnuGfei104)

Q76 JEE Main 2022 · 28 Jul · Shift 2

Statement I : An alloy of lithium and magnesium is used to make aircraft plates.

Statement II : The magnesium ions are important for cell-membrane integrity.

In the light the above statements, choose the correct answer from the options given below :

- (A) Both Statement I and Statement II are true
- (B) Both Statement I and Statement II are false
- (C) Statement I is true but Statement II is false
- (D) Statement I is false but Statement II is true

[Step-by-step solution ► prepwisser.in/questions/4FmzkyaTCt](https://www.prepwisser.in/questions/4FmzkyaTCt)

Q77 JEE Main 2022 · 26 Jul · Shift 2

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.

Assertion A: LiF is sparingly soluble in water.

Reason R: The ionic radius of Li^+ ion is smallest among its group members, hence has least hydration enthalpy.

In the light of the above statements, choose the most appropriate answer from the options given below.

- (A) Both A and R are true and R is the correct explanation of A.
- (B) Both A and R are true but R is NOT the correct explanation of A.
- (C) A is true but R is false.
- (D) A is false but R is true.

[Step-by-step solution ► prepwisser.in/questions/nrBhpowAYB](https://www.prepwisser.in/questions/nrBhpowAYB)

Q78 JEE Main 2022 · 26 Jul · Shift 1

Reaction of BeCl_2 with LiAlH_4 gives :

- (A) AlCl_3
- (B) BeH_2
- (C) LiH
- (D) LiCl
- (E) BeAlH_4

Choose the correct answer from options given below :

- (A) (A), (D) and (E)
- (B) (A), (B) and (D)
- (C) (D) and (E)
- (D) (B), (C) and (D)

[Step-by-step solution ► prepwisser.in/questions/Xn671DjHl5](https://www.prepwisser.in/questions/Xn671DjHl5)

Q79 JEE Main 2022 · 27 Jun · Shift 2

BeO reacts with HF in presence of ammonia to give [A] which on thermal decomposition produces [B] and ammonium fluoride. Oxidation state of Be in [A] is _____.

Numerical answer — enter the value.

[Step-by-step solution ► prepwisser.in/questions/onO_JA1HKu](https://www.prepwisser.in/questions/onO_JA1HKu)

Q80 JEE Main 2022 · 26 Jun · Shift 2

s-block element which cannot be qualitatively confirmed by the flame test is :

- (A) Li (B) Na
(C) Rb (D) Be

[Step-by-step solution ► prepwisser.in/questions/opfjQSLji_](https://www.prepwisser.in/questions/opfjQSLji_)

Q81 JEE Main 2022 · 24 Jun · Shift 1

Which of the following statements are correct?

- (A) Both LiCl and MgCl_2 are soluble in ethanol.
(B) The oxides Li_2O and MgO combine with excess of oxygen to give superoxide.
(C) LiF is less soluble in water than other alkali metal fluorides.
(D) Li_2O is more soluble in water than other alkali metal oxides.

Choose the most appropriate answer from the options given below :

- (A) (A) and (C) only (B) (A), (C) and (D) only
(C) (B) and (C) only (D) (A) and (D) only

[Step-by-step solution ► prepwisser.in/questions/0CUgjlWO1R](https://www.prepwisser.in/questions/0CUgjlWO1R)

Q82 JEE Main 2021 · 31 Aug · Shift 2

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Lithium salts are hydrated.

Reason (R) : Lithium has higher polarising power than other alkali metal group members.

In the light of the above statements, choose the most appropriate answer from the options given below :

- (A) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
(B) (A) is correct but (R) is not correct.
(C) (A) is not correct but (R) is correct.
(D) Both (A) and (R) are correct and (R) is the correct explanation of (A)

[Step-by-step solution ► prepwisser.in/questions/TIaSm3iU_b](https://www.prepwisser.in/questions/TIaSm3iU_b)

Match List - I with List - II :

List - I**List - II**

- (a) NaOH (i) Acidic
(b) $Be(OH)_2$ (ii) Basic
(c) $Ca(OH)_2$ (iii) Amphoteric
(d) $B(OH)_3$
(e) $Al(OH)_3$

Choose the most appropriate answer from the options given below

(A) (a)-(ii), (b)-(ii), (c)-(iii), (d)-(ii), (e)-(iii)

(B) (a)-(ii), (b)-(iii), (c)-(ii), (d)-(i), (e)-(iii)

(C) (a)-(ii), (b)-(ii), (c)-(iii), (d)-(i), (e)-(iii)

(D) (a)-(ii), (b)-(i), (c)-(ii), (d)-(iii), (e)-(iii)

[Step-by-step solution ► prepwisar.in/questions/Yv01PI-qyl](https://www.prepwisar.in/questions/Yv01PI-qyl)

Given below are two statements : One is labelled as Assertion A and the other labelled as Reason R.

Assertion A : Lithium halides are somewhat covalent in nature.

Reason R : Lithium possesses high polarisation capability.

In the light of the above statements, choose the most appropriate answer from the options given below :

(A) A is true but R is false

(B) A is false but R is true

(C) Both A and R are true but R is NOT the correct explanation of A

(D) Both A and R are true and R is the correct explanation of A

[Step-by-step solution ► prepwisar.in/questions/NburAdEoU7](https://www.prepwisar.in/questions/NburAdEoU7)

Q85 JEE Main 2021 · 16 Mar · Shift 1

Given below are two statements :

Statement I : Both $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$ and $\text{MgCl}_2 \cdot 8\text{H}_2\text{O}$ undergo dehydration on heating.

Statement II : BeO is amphoteric whereas the oxides of other elements in the same group are acidic.

In the light of the above statements, choose the correct answer from the options given below :

- (A) Both statement I and statement II are false
- (B) Statement I is false but statement II is true
- (C) Statement I is true but statement II is false
- (D) Both statement I and statement II are true

[Step-by-step solution ► prepwisser.in/questions/WoiM6lySqC](https://www.prepwisser.in/questions/WoiM6lySqC)

Q86 JEE Main 2020 · 4 Sep · Shift 2

An alkaline earth metal 'M' readily forms water soluble sulphate and water insoluble hydroxide. Its oxide MO is very stable to heat and does not have rock-salt structure. M is :

- | | |
|--------|--------|
| (A) Ca | (B) Mg |
| (C) Sr | (D) Be |

[Step-by-step solution ► prepwisser.in/questions/7NO9Ueste-](https://www.prepwisser.in/questions/7NO9Ueste-)

Q87 JEE Main 2020 · 9 Jan · Shift 2

Among the statements (a)-(d) the correct ones are :

- (a) Lithium has the highest hydration enthalpy among the alkali metals.
- (b) Lithium chloride is insoluble in pyridine.
- (c) Lithium cannot form ethynide upon its reaction with ethyne.
- (d) Both lithium and magnesium react slowly with H_2O .

- | | |
|---------------------------|---------------------------|
| (A) (b) and (c) only | (B) (a) and (d) only |
| (C) (a), (b) and (d) only | (D) (a), (c) and (d) only |

[Step-by-step solution ► prepwisser.in/questions/vIe5WIwfdN](https://www.prepwisser.in/questions/vIe5WIwfdN)

Hydrogen Peroxide · 16 PYQs

Q88 JEE Main 2023 · 8 Apr · Shift 2

Which of the following can reduce decomposition of H_2O_2 on exposure to light :

- | | |
|------------|----------------------|
| (A) Urea | (B) Glass containers |
| (C) Alkali | (D) Dust |

[Step-by-step solution ► prepwisser.in/questions/WAc2x2pl9i](https://www.prepwisser.in/questions/WAc2x2pl9i)

Q89 JEE Main 2023 · 1 Feb · Shift 2

The starting material for convenient preparation of deuterated hydrogen peroxide (D_2O_2) in :

- (A) BaO_2 (B) 2-ethylanthraquinol
(C) BaO (D) $K_2S_2O_8$

Step-by-step solution ► [prepwisar.in/questions/k730R1zw1d](https://www.prepwisar.in/questions/k730R1zw1d)

Q90 JEE Main 2023 · 1 Feb · Shift 2

O – O bond length in H_2O_2 is X than the O – O bond length in F_2O_2 . The O – H bond length in H_2O_2 is Y than that of the O – F bond in F_2O_2 .

Choose the correct option for X and Y from those given below :

- (A) X - shorter, Y - longer
(B) X - longer, Y - shorter
(C) X - shorter, Y - shorter
(D) X - longer, Y - longer

Step-by-step solution ► [prepwisar.in/questions/oMcLVqfH0B](https://www.prepwisar.in/questions/oMcLVqfH0B)

Q91 JEE Main 2023 · 31 Jan · Shift 2

Given below are two statements :

Statement I : H_2O_2 is used in the synthesis of Cephalosporin

Statement II : H_2O_2 is used for the restoration of aerobic conditions to sewage wastes.

In the light of the above statements, choose the most appropriate answer from the options given below :

- (A) Statement I is incorrect but Statement II is correct
(B) Statement I is correct but Statement II is incorrect
(C) Both Statement I and Statement II are incorrect
(D) Both Statement I and Statement II are correct

Step-by-step solution ► [prepwisar.in/questions/Off2pOLfX3](https://www.prepwisar.in/questions/Off2pOLfX3)

Q92 JEE Main 2023 · 25 Jan · Shift 1

'25 volume' hydrogen peroxide means

- (A) 1 L marketed solution contains 75 g of H_2O_2 .
(B) 1 L marketed solution contains 250 g of H_2O_2 .
(C) 1 L marketed solution contains 25 g of H_2O_2 .
(D) 100 mL marketed solution contains 25 g of H_2O_2 .

Step-by-step solution ► [prepwisar.in/questions/GFHCS5y6V](https://www.prepwisar.in/questions/GFHCS5y6V)

Q93 JEE Main 2023 · 24 Jan · Shift 2

In which of the following reactions the hydrogen peroxide acts as a reducing agent?

- (A) $Mn^{2+} + H_2O_2 \rightarrow Mn^{4+} + 2OH^-$
(B) $HOCl + H_2O_2 \rightarrow H_3O^+ + Cl^- + O_2$
(C) $PbS + 4H_2O_2 \rightarrow PbSO_4 + 4H_2O$
(D) $2Fe^{2+} + H_2O_2 \rightarrow 2Fe^{3+} + 2OH^-$

Step-by-step solution ► [prepwisar.in/questions/AxIy9Kj1zV](https://www.prepwisar.in/questions/AxIy9Kj1zV)

Q94 JEE Main 2022 · 27 Jul · Shift 1

Given below are two statements.

Statement I : Hydrogen peroxide can act as an oxidizing agent in both acidic and basic conditions.

Statement II : Density of hydrogen peroxide at 298K is lower than that of D_2O .

In the light of the above statements, choose the correct answer from the options given below.

(A) Both Statement I and Statement II are true.

(B) Both Statement I and Statement II are false.

(C) Statement I is true but Statement II is false.

(D) Statement I is false but Statement II is true.

[Step-by-step solution ► prepwisser.in/questions/NQfPLoZyg6](https://www.prepwisser.in/questions/NQfPLoZyg6)

Q95 JEE Main 2022 · 26 Jul · Shift 1

Which of the following can be used to prevent the decomposition of H_2O_2 ?

(A) Urea

(B) Formaldehyde

(C) Formic acid

(D) Ethanol

[Step-by-step solution ► prepwisser.in/questions/ZHU9jV4OKQ](https://www.prepwisser.in/questions/ZHU9jV4OKQ)

Q96 JEE Main 2022 · 29 Jun · Shift 1

Which one of the following reactions indicates the reducing ability of hydrogen peroxide in basic medium?

(A) $HOCl + H_2O_2 \rightarrow H_3O^+ + Cl^- + O_2$

(B) $PbS + 4H_2O_2 \rightarrow PbSO_4 + 4H_2O$

(C) $2MnO_4^- + 3H_2O_2 \rightarrow 2MnO_2 + 3O_2 + 2H_2O + 2OH^-$

(D) $Mn^{2+} + H_2O_2 \rightarrow Mn^{4+} + 2OH^-$

[Step-by-step solution ► prepwisser.in/questions/UoOMTwegV9](https://www.prepwisser.in/questions/UoOMTwegV9)

Q97 JEE Main 2022 · 27 Jun · Shift 1

Addition of H_2SO_4 to BaO_2 produces :

(A) BaO , SO_2 and H_2O

(B) $BaHSO_4$ and O_2

(C) $BaSO_4$, H_2 and O_2

(D) $BaSO_4$ and H_2O_2

[Step-by-step solution ► prepwisser.in/questions/ozoB6I0j7o](https://www.prepwisser.in/questions/ozoB6I0j7o)

Q98 JEE Main 2021 · 27 Aug · Shift 2

The oxide that gives H_2O_2 most readily on treatment with H_2O is :

- (A) PbO_2
- (B) Na_2O_2
- (C) SnO_2
- (D) $\text{BaO}_2 \cdot 8\text{H}_2\text{O}$

Step-by-step solution ► [prepwiser.in/questions/ufy4-TgdX8](https://www.prepwiser.in/questions/ufy4-TgdX8)

Q99 JEE Main 2021 · 16 Mar · Shift 2

The correct statements about H_2O_2 are :

- (A) used in the treatment of effluents.
- (B) used as both oxidising and reducing agents.
- (C) the two hydroxyl groups lie in the same plane.
- (D) miscible with water.

Choose the correct answer from the options given below :

- | | |
|---------------------------|---------------------------|
| (A) (A), (C) and (D) only | (B) (A), (B), (C) and (D) |
| (C) (A), (B) and (D) only | (D) (B), (C) and (D) only |

Step-by-step solution ► [prepwiser.in/questions/O6VyjvHJWw](https://www.prepwiser.in/questions/O6VyjvHJWw)

Q100 JEE Main 2021 · 16 Mar · Shift 1

Given below are two statements :

Statement I : H_2O_2 can act as both oxidising and reducing agent in basic medium.

Statement II : In the hydrogen economy, the energy is transmitted in the form of dihydrogen.

In the light of the above statements, choose the correct answer from the options given below :

- (A) Both statement I and statement II are false
- (B) Statement I is false but statement II is true
- (C) Statement I is true but statement II is false
- (D) Both statement I and statement II are true

Step-by-step solution ► [prepwiser.in/questions/MkE5wL5Qdh](https://www.prepwiser.in/questions/MkE5wL5Qdh)

Q101 JEE Main 2021 · 25 Feb · Shift 1

Which of the following equation depicts the oxidizing nature of H_2O_2 ?

- (A) $\text{Cl}_2 + \text{H}_2\text{O}_2 \rightarrow 2\text{HCl} + \text{O}_2$
(B) $\text{KIO}_4 + \text{H}_2\text{O}_2 \rightarrow \text{KIO}_3 + \text{H}_2\text{O} + \text{O}_2$
(C) $2\text{I}^- + \text{H}_2\text{O}_2 + 2\text{H}^+ \rightarrow \text{I}_2 + 2\text{H}_2\text{O}$
(D) $\text{I}_2 + \text{H}_2\text{O}_2 + 2\text{OH}^- \rightarrow 2\text{I}^- + 2\text{H}_2\text{O} + \text{O}_2$

Step-by-step solution ► [prepwiser.in/questions/uvtHrndKW1](https://www.prepwiser.in/questions/uvtHrndKW1)

Q102 JEE Main 2020 · 3 Sep · Shift 1

The volume strength of 8.9 M H_2O_2 solution calculated at 273 K and 1 atm is _____. ($R = 0.0821 \text{ L atm K}^{-1} \text{ mol}^{-1}$) (rounded off to the nearest integer)

Numerical answer — enter the value.

Step-by-step solution ► [prepwiser.in/questions/BjJq0oz4E](https://www.prepwiser.in/questions/BjJq0oz4E)

Q103 JEE Main 2020 · 7 Jan · Shift 2

Among the statements (a) - (d), the correct ones are :

- (a) Decomposition of hydrogen peroxide gives dioxygen.
(b) Like hydrogen peroxide, compounds, such as KClO_3 , $\text{Pb}(\text{NO}_3)_2$ and NaNO_3 when heated liberate dioxygen.
(c) 2-Ethylanthraquinone is useful for the industrial preparation of hydrogen peroxide.
(d) Hydrogen peroxide is used for the manufacture of sodium perborate.

- (A) (a), (b), (c) and (d) (B) (a) and (c) only
(C) (a), (b) and (c) only (D) (a), (c) and (d) only

Step-by-step solution ► [prepwiser.in/questions/lmDWbYkCF8](https://www.prepwiser.in/questions/lmDWbYkCF8)

Answer key — Hydrogen & s-Block Elements

Numbers match the question numbers above. For full working, open the solution link under each question.

1	B	2	D	3	D	4	C	5	D	6	D	7	D	8	3
9	A	10	D	11	B	12	C	13	A	14	B	15	A	16	A
17	B	18	D	19	1	20	D	21	C	22	D	23	B	24	6
25	D	26	D	27	A	28	C	29	A	30	B	31	A	32	B
33	C	34	D	35	D	36	A	37	B	38	B	39	A	40	D
41	C	42	2	43	D	44	A	45	A	46	C	47	D	48	D
49	D	50	D	51	A	52	C	53	C	54	C	55	D	56	B
57	C	58	B	59	A	60	D	61	A	62	C	63	A	64	A
65	B	66	B	67	A	68	A	69	C	70	B	71	C	72	B
73	B	74	B	75	B	76	B	77	C	78	B	79	2	80	D
81	A	82	A	83	B	84	D	85	A	86	D	87	D	88	A
89	D	90	B	91	D	92	A	93	B	94	C	95	A	96	C
97	D	98	B	99	C	100	D	101	C	102	100	103	A		

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