

JEE Mains 2019 Chapter wise Question Bank

s-Block Elements - Questions

Q1

The alkaline earth metal nitrate that does not crystallise with water molecules, is:

- (1) $\text{Mg}(\text{NO}_3)_2$ (2) $\text{Sr}(\text{NO}_3)_2$
(3) $\text{Ca}(\text{NO}_3)_2$ (4) $\text{Ba}(\text{NO}_3)_2$

9 Jan Morning

Q2

The metal that forms nitride by reacting directly with N_2 of air, is:

- (1) K (2) Li
(3) Rb (4) Cs

9 Jan Evening

Q3

The metal used for making X-ray tube window is:

- (1) Mg (2) Na (3) Be (4) Ca

10 Jan Morning

Q4

Sodium metal on dissolution in liquid ammonia gives a deep blue solution due to the formation of:

- (1) sodium-ammonia complex
(2) sodamide
(3) sodium ion-ammonia complex
(4) ammoniated electrons

10 Jan Evening

Q5

NaH is an example of:

- (1) Electron-rich hydride
(2) Metallic hydride
(3) Saline hydride
(4) Molecular hydride

11 Jan Morning

Q6

The amphoteric hydroxide is :

- (1) $\text{Be}(\text{OH})_2$ (2) $\text{Ca}(\text{OH})_2$
(3) $\text{Mg}(\text{OH})_2$ (4) $\text{Sr}(\text{OH})_2$

11 Jan Morning

Q7

A metal on combustion in excess of air forms X. X upon hydrolysis with water yields H_2O_2 and O_2 along with another product. The metal is:

- (1) Na (2) Rb
(3) Mg (4) Li

12 Jan Morning

Q8

The correct order of hydration enthalpies of alkali metal ions is :

- (1) $\text{Li}^+ > \text{Na}^+ > \text{K}^+ > \text{Cs}^+ > \text{Rb}^+$
(2) $\text{Na}^+ > \text{Li}^+ > \text{K}^+ > \text{Rb}^+ > \text{Cs}^+$
(3) $\text{Na}^+ > \text{Li}^+ > \text{K}^+ > \text{Cs}^+ > \text{Rb}^+$
(4) $\text{Li}^+ > \text{Na}^+ > \text{K}^+ > \text{Rb}^+ > \text{Cs}^+$

8 April Morning

Q9

The covalent alkaline earth metal halide ($\text{X} = \text{Cl}, \text{Br}, \text{I}$) is :

- (1) MgX_2 (2) CaX_2 (3) BeX_2 (4) SrX_2

8 April Evening

Q10

The element having greatest difference between its first and second ionization energies, is:

- (1) Ca (2) Sc (3) Ba (4) K

9 April Morning

Q11

s-Block Elements

Magnesium powder burns in air to give:

- (1) $\text{Mg}(\text{NO}_3)_2$ and Mg_3N_2
- (2) MgO and Mg_3N_2
- (3) MgO only
- (4) MgO and $\text{Mg}(\text{NO}_3)_2$

9 April Morning

Q11

The structures of beryllium chloride in the solid state and vapour phase, respectively, are:

- (1) chain and chain
- (2) dimeric and dimeric
- (3) chain and dimeric
- (4) dimeric and chain

9 April Evening

Q12

A hydrated solid X on heating initially gives a monohydrated compound Y. Y upon heating above 373 K leads to an anhydrous white powder Z. X and Z, respectively, are :

- (1) Washing soda and soda ash
- (2) Baking soda and dead burnt plaster.
- (3) Washing soda and dead burnt plaster.
- (4) Baking soda and soda ash.

10 April Evening

Q13

The metal that gives hydrogen gas upon treatment with both acid as well as base is :

- (1) magnesium
- (2) mercury
- (3) zinc
- (4) iron

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Q14

The correct sequence of thermal stability of the following carbonates is :

- (1) $\text{BaCO}_3 < \text{CaCO}_3 < \text{SrCO}_3 < \text{MgCO}_3$
- (2) $\text{MgCO}_3 < \text{CaCO}_3 < \text{SrCO}_3 < \text{BaCO}_3$
- (3) $\text{MgCO}_3 < \text{SrCO}_3 < \text{CaCO}_3 < \text{BaCO}_3$
- (4) $\text{BaCO}_3 < \text{SrCO}_3 < \text{CaCO}_3 < \text{MgCO}_3$

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Q14

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The INCORRECT statement is :

- (1) Lithium is the strongest reducing agent among the alkali metals.
- (2) Lithium is least reactive with water among the alkali metals.
- (3) LiNO_3 decomposes on heating to give LiNO_2 and O_2 .
- (4) LiCl crystallises from aqueous solution as $\text{LiCl} \cdot 2\text{H}_2\text{O}$.

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Q15

Among the following, the energy of 2s orbital is lowest in :

- (1) K
- (2) H
- (3) Li
- (4) Na

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s-Block Elements - Answers

Q1

- (4) The chances of formation of hydrate decreases with the decrease in the charge density down the group. This is why, $\text{Ba}(\text{NO}_3)_2$ does not crystallise with water molecules.

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Q2

- (2) Amongst the given alkali metals, only lithium can react with N_2 in air to form lithium nitride.

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Q3

- (3) Be is transparent to X-rays, so it is used in making X-ray tube windows.

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Q4

- (4) Sodium metal on dissolution in liquid ammonia gives a deep blue solution due to the ammoniated electrons.

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Q5

- (3) NaH is an ionic hydride which is also known as saline hydride.

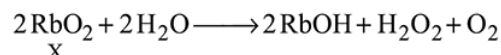
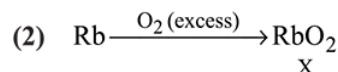
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Q6

- (1) $\text{Be}(\text{OH})_2$ is amphoteric in nature.

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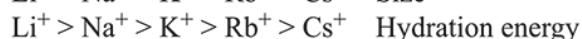
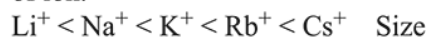
Q7



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Q8

- (4) Hydration energy is inversely proportional to the size of ion.



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Q9

- (3) According to Fajan's rule, greater the polarising power of cation greater would be the covalent character. Since, Be^{2+} has maximum polarising power among given cations. Therefore, BeX_2 would be most covalent alkaline earth metal halides among the given halides.

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Q10

- (4) Alkali metals have high difference in the first and second ionisation energy as they achieve stable noble gas configuration after first ionisation.

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Q11

- (2) Mg burns in air and produces a mixture of nitride and oxide

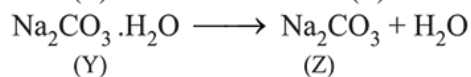
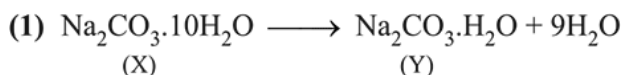
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Q11

- (3) BeCl_2 in vapour phase exists as dimer (below 1200 K temperature) whereas, in solid state BeCl_2 has chain structure.

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Q12

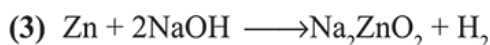


X = Washing soda

Z = Soda ash

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Q13

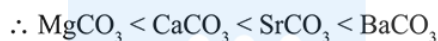


Zn is an amphoteric element.

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Q14

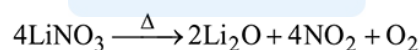
- (2) Thermal stability of alkaline earth metal carbonates increases down the group.



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Q14

- (3) Lithium nitrate decomposes into its oxide on heating.



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Q15

- (1) As the value of Z (atomic number) increases, energy of orbitals decreases (becomes more -ve value)

 \therefore Order of energy of 2s orbital is $\text{H} > \text{Li} > \text{Na} > \text{K}$.

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