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) $Mg(NO_3)_2$ (2) $Sr(NO_3)_2$
(3) $Ca(NO_3)_2$ (4) $Ba(NO_3)_2$

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) $Be(OH)_2$ (2) $Ca(OH)_2$
(3) $Mg(OH)_2$ (4) $Sr(OH)_2$

11 Jan Morning

Q7

A metal on combution 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) $Li^+ > Na^+ > K^+ > Cs^+ > Rb^+$
(2) $Na^+ > Li^+ > K^+ > Rb^+ > Cs^+$
(3) $Na^+ > Li^+ > K^+ > Cs^+ > Rb^+$
(4) $Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$

8 April Morning

Q9

The covalent alkaline earth metal halide (X = Cl, Br, 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

Magnesium powder burns in air to give:

(1) $Mg(NO_3)_2$ and Mg_3N_2

(2) MgO and Mg_3N_2

(3) MgO only

(4) MgO and $Mg(NO_3)_2$

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

12 April Morning

Q14

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

(1) $BaCO_3 < CaCO_3 < SrCO_3 < MgCO_3$

(2) $MgCO_3 < CaCO_3 < SrCO_3 < BaCO_3$

(3) $MgCO_3 < SrCO_3 < CaCO_3 < BaCO_3$

(4) $BaCO_3 < SrCO_3 < CaCO_3 < MgCO_3$

12 April Morning

Q14

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 $LiCl \cdot 2H_2O$.

12 April Evening

Q15

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

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

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JEE Mains 2019 Chapter wise Question Bank

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, $Ba(NO_3)_2$ does not crystallise with water molecules.

9 Jan Morning

Q2

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

9 Jan Evening

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.

10 Jan Evening

Q5

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

11 Jan Morning

Q6

(1) $Be(OH)_2$ is amphoteric in nature.

11 Jan Morning

Q7

(2) $Rb \xrightarrow{O_2\ (excess)} \underset{X}{RbO_2}$

$$\underset{X}{2RbO_2} + 2H_2O \longrightarrow 2RbOH + H_2O_2 + O_2$$

12 Jan Morning

Q8

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

$Li^+ < Na^+ < K^+ < Rb^+ < Cs^+$ Size

$Li^+ > Na^+ > K^+ > Rb^+ > Cs^+$ Hydration energy

8 April Morning

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

9 April Morning

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

(1) $\underset{(X)}{Na_2CO_3.10H_2O} \longrightarrow \underset{(Y)}{Na_2CO_3.H_2O} + 9H_2O$

$\underset{(Y)}{Na_2CO_3.H_2O} \longrightarrow \underset{(Z)}{Na_2CO_3} + H_2O$

X = Washing soda

Z = Soda ash

10 April Evening

Q13

(3) $Zn + 2NaOH \longrightarrow Na_2ZnO_2 + H_2$

$Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$

Zn is an amphoteric element.

12 April Morning

Q14

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

$\therefore MgCO_3 < CaCO_3 < SrCO_3 < BaCO_3$

12 April Morning

Q14

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

$4LiNO_3 \xrightarrow{\Delta} 2Li_2O + 4NO_2 + O_2$

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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 2*s* orbital is H > Li > Na > K.

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