



## CHEMISTRY

### BOOKS - CENGAGE CHEMISTRY (HINGLISH)

#### S-BLOCK GROUP 2 - ALKALINE EARTH METALS

#### Illustration

1. Given, the enthalpy of formation of  $MgCl_{(s)}$  is  $-125kJmol^{-1}$  and the enthalpy of formation of  $MgCl_{2(s)}$  is  $-642kJmol^{-1}$ . Predict whether  $MgCl$

will undergo disproportionation or not? If yes, calculate the enthalpy of disproportionation.



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2. The second ionisation enthalpy of the elements of group 1 are higher than those of elements of group 2. Explain.



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3. What is the order of the second ionisation enthalpy of  $K$ ,  $Ca$  and  $Ba$ ?



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4. (a) Why alkaline earth metals are harder, have higher melting points and higher densities than the alkali metals?

(b). Why the atoms of alkaline earth metals are smaller than the corresponding alkali metals?

(c ). Why alkaline earth metals have high electrical and thermal conductivities?

(d). What is black ash?

(e). Why the variation in physical properties of alkaline earth elements is not as regular as in the case of alkali metals?



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5. (a). Mention the most abundant and least abundant alkaline earth metal in the earth's crust.

(b). Mention at least five important properties of alkaline earth metals which increase from *Be* to *Ba*.

c. Arrange alkaline earth metals in order of decreasing hydration enthalpy.

d. *Ca*, *Sr* and *Ba* generally form ionic compounds. why?

e. Mention colours of *Ca*, *Ba* and *Sr* in flame test.



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6. (a). Which alkaline earth metals do not give characteristic colour to the Bunsen flame?

(b). Why alkaline earth metals do not form tripositive ions?

(c ). Why alkaline earth metals are diamagnetic, but alkali metals are paramagnetic?

(d). Why the first ionisation enthalpy of alkaline earth metals is higher than those of corresponding alkali metals?

(e). Why alkaline earth metals are less electropositive than corresponding alkali metals?



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7. (a).  $Na_2SO_4$  is soluble in water whereas  $BaSO_4$  is insoluble. Why?

(b). When  $Mg$  metal is burnt in air, a white powder is left behind as ash. What is the white powder?



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8. (a)  $[BeF_4]^{2-}$  exists, but  $[BeCl_6]^{4-}$  does not. Give reason.

(b). Hydrated beryllium ion exists as  $[Be(H_2O)_4]^{2+}$ , whereas hydrated magnesium ion exists as  $[Mg(H_2O)_6]^{2+}$ . Give reason.

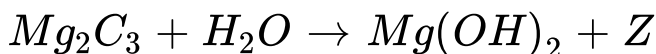
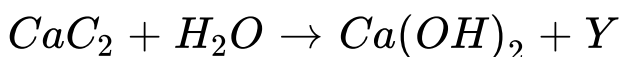


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9. (a) Why does the solubility of alkaline earth metal hydroxides in water increase down the group.

(b). Why does the solubility of alkaline earth metal carbonates and sulphates in water decrease down the group?

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Identify (X), (Y) and (Z).

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**11.** Give reasons for the following:

(a). Alkaline earth metals cannot be obtained by chemical reduction.

(b). Alkaline earth metals have stronger tendency to form complexes than alkali metals.

(c). Magnesium nitride on reacting with water gives ammonia, but magnesium chloride does not give *HCl* on reacting with water.

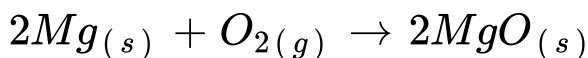


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**12.**  $1.0\text{g}$  of magnesium ribbon was placed in a crucible and heated with the lid on, until the magnesium began to burn brilliantly. At the end of experiment, there was  $1.45\text{g}$  of white powder.

Show that this result does not agree with the equation:



Give an explanation for your answer.



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**13.** (a). Give an example of laboratory desiccant.

(b). What are the products formed when

$MgCl_2 \cdot 6H_2O$  is heated?



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14. Plaster of paris on losing water and gaining water gives  $A$  and  $B$ . Identify  $A$  and  $B$ .



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15.  $BaO_2$  is a peroxide, but  $PbO_2$  is not a peroxide. Why?



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16. Which is the weakest base among  $\text{NaOH}$ ,  $\text{Ca(OH)}_2$ ,  $\text{KOH}$  and  $\text{Be(OH)}_2$ .



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17. (a). Why sodium chloride is added during electrolysis of fused anhydrous magnesium chloride?

(b). Why magnesium oxide is used for the lining of steel making furnace?



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**18.** Give the names and formula of the compounds indicated in the following statements.

(a). A compounds of *Ca* used in setting fractured bones.

(b). A compounds of calcium and hydrogen which is used as a portable source of hydrogen for filling balloons.

(c ). A compounds of *Ca, O, Cl* and *H* used as germicide.

(d). A compound of *Mg, O, Cl* and *H* used as a cement for joining cracked teeth.

(e). A compound of *Mg, Cl* and *O* used as a drying agent. ItbRgt (f). A compound of *Ca* and *O* which

when heated in oxycoal gas flame gives limelight.

(g). A compound of  $Ca$ ,  $C$  and  $N$  used as a fertiliser.

(h). A triatomic compound of  $Ca$  which gives  $H_2$  on treatments with water.



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19. (a). What is the hybrid state of  $Be$  in  $BeCl_2$  in vapour state. What will be the change in the hybrid state of  $BeCl_2$  in the solid state?

(b). Draw the structure of (i)  $BeCl_2$  (vapour state) and (ii)  $BeCl_2$  (solid state).

(c ). Why do halides and hydrides of beryllium polymerise?



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## Solved Example

1. Chemical ( $X$ ) is used for water softening to remove temporary hardness. ( $X$ ) reacts with sodium carbonate to generate caustic soda. When  $CO_2$  is bubbled through ( $X$ )?



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2. Magnesium on heating in air gives ( $A$ ) and ( $B$ ). On reaction with water ( $B$ ) gives a colourless gas ( $C$ ). ( $C$ ) when passed through  $CuSO_4$  solution,

gives a blue coloured solution ( $D$ ). Identify ( $A$ ), ( $B$ ), ( $C$ ) and ( $D$ ).

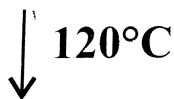
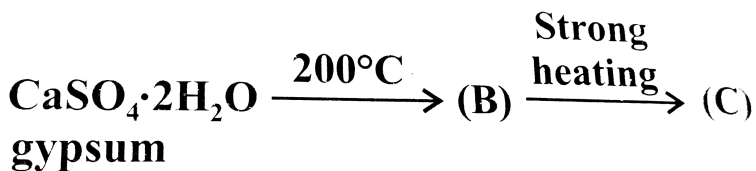


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3. Thermal decomposition of a compound ( $X$ ) yields, a basic oxide ( $Y$ ) and an acidic oxide ( $Z$ ) simultaneously. The acidic oxide ( $Z$ ) can be absorbed by alkaline  $KOH$ . Identify ( $X$ ), ( $Y$ ) and ( $Z$ ).



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4. (A)

Identify (A), (B) and (C).

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5. When a colourless gas (A), which is poisonous and burns with blue flame, is passed through aqueous  $\text{NaOH}$  solution, gives a compound (B). Compound (B) on heating gives (C). (C) gives a



white precipitate ( $D$ ) with  $CaCl_2$ . Both ( $C$ ) and ( $D$ ) decolourises  $KMnO_4$ . Identify ( $A$ ) to ( $D$ ).



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6. An element ( $A$ ) of group 2 gives brick red colour in the Bunsen flame. ( $A$ ) burns in nitrogen atmosphere to give ( $B$ ), which gets hydrolysed to produce gas ( $C$ ) and an alkaline solution ( $D$ ). The solution ( $D$ ) on exposure to air produces a thin solid layer ( $E$ ) on the surface. Identify ( $A$ ) to ( $E$ ).



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## Exercises Linked Comprehension

1. Solubility of an ionic compound in water is mainly dependent on:

a. Lattice enthalpy, b. Hydration enthalpy

Both these factors oppose each other and the resultant of these determines the solubility of an ionic compound in water. If lattice enthalpy has greater value, the compound is less soluble.

In case hydration enthalpy has greater value, the compound is highly soluble in water.

Compound of alkaline earth metals are less soluble than alkali metals, due to:

- A. Their high hydration enthalpy
- B. Their high lattice enthalpy
- C. Their increases covalent character
- D. Their high ionisation enthalpy.

**Answer: B**



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2. Solubility of an ionic compound in water is mainly dependent on:

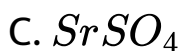
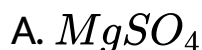
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resultant of these determines the solubility of an ionic compound in water. If lattice enthalpy has greater value, the compound is less soluble.

In case hydration enthalpy has greater value, the compound is highly soluble in water.

Which of the following is more soluble in water?



**Answer: A**



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Both these factors oppose each other and the resultant of these determines the solubility of an ionic compound in water. If lattice enthalpy has greater value, the compound is less soluble.

In case hydration enthalpy has greater value, the compound is highly soluble in water.

$BeF_2$  is soluble in water while fluorides of other alkaline earth metals are insoluble because of:

A. Covalent nature of  $BeF_2$

B. Ionic nature of  $BeF_4$

C. Greater hydration enthalpy of  $Be^{2+}$  ion

D. Greater lattice enthalpy of  $Be^{2+}$  ion

**Answer: C**



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4. Solubility of an ionic compound in water is mainly dependent on:

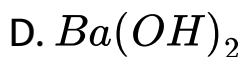
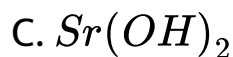
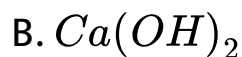
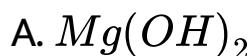
a. Lattice enthalpy, b. Hydration enthalpy

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greater value, the compound is less soluble.

In case hydration enthalpy has greater value, the compound is highly soluble in water.

Which of the following is less soluble in water?



**Answer: A**



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5. Solubility of an ionic compound in water is mainly dependent on:

a. Lattice enthalpy, b. Hydration enthalpy

Both these factors oppose each other and the resultant of these determines the solubility of an ionic compound in water. If lattice enthalpy has greater value, the compound is less soluble.

In case hydration enthalpy has greater value, the compound is highly soluble in water. Compound is soluble in water if

A. Hydration enthalpy is greater than lattice enthalpy



B. Hydration enthalpy is less than lattice enthalpy

C. hydration enthalpy and lattice enthalpy are same

D. None of the above

**Answer: A**

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6. Alkali and alkaline earth metals have low ionisation enthalpies and hence exhibit characteristic flame colouration. They have high negative electrode potentials and hence are strong reducing agents.

They dissolve in liquid ammonia to give a solution which conducts electricity and act as strong reducing agent. being stronger reducing agent than hydrogen, they are usually prepared by the electrolysis of their fused chlorides. Their oxides are basic and the basic strength increases down the group. The solubility of carbonates and sulphates of alkali and alkaline earth metals show opposite trends. only the carbonates of *Li* and alkaline earth metals decompose on heating. The bicarbonates of both alkali and alkaline earth metals on heating give carbonates.

Which of the following process is used in the extractive metallurgy of sodium?

A. Electrolysis of aqueous solution

B. Thermite reduction

C. Electrolysis of fused salt

D. Self-reduction

**Answer: C**

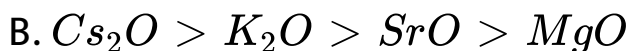
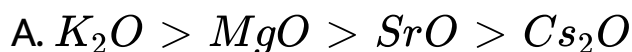


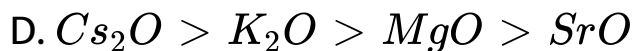
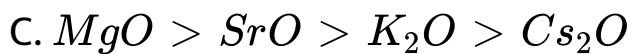
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7. Alkali and alkaline earth metals have low ionisation enthalpies and hence exhibit characteristic flame colouration. They have high negative electrode potentials and hence are strong reducing agents. They dissolve in liquid ammonia to give a solution which conducts electricity and act as strong reducing

agent. being stronger reducing agent than hydrogen, they are usually prepared by the electrolysis of their fused chlorides. Their oxides are basic and the basic strength increases down the group. The solubility of carbonates and sulphates of alkali and alkaline earth metals show opposite trends. only the carbonates of *Li* and alkaline earth metals decompose on heating. The bicarbonates of both alkali and alkaline earth metals on heating give carbonates.

The correct decreasing order of basic character of the oxides is





**Answer: B**



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8. Alkali and alkaline earth metals have low ionisation enthalpies and hence exhibit characteristic flame colouration. They have high negative electrode potentials and hence are strong reducing agents. They dissolve in liquid ammonia to give a solution which conducts electricity and act as strong reducing agent. being stronger reducing agent than hydrogen,

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Property of alkaline earth metals that increases with their atomic number is

- A. Ionisation enthalpy
- B. Solubility of their hydroxides
- C. Solubility of their sulphates

## D. Electronegativity

**Answer: B**

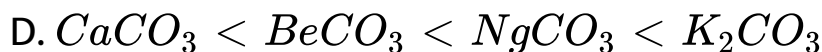
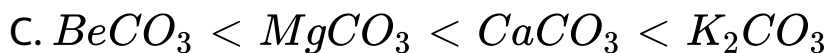
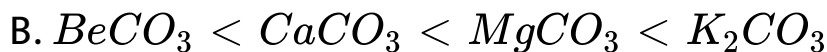
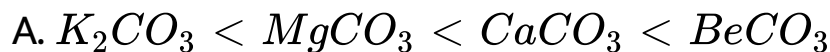


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9. Alkali and alkaline earth metals have low ionisation enthalpies and hence exhibit characteristic flame colouration. They have high negative electrode potentials and hence are strong reducing agents. They dissolve in liquid ammonia to give a solution which conducts electricity and act as strong reducing agent. being stronger reducing agent than hydrogen, they are usually prepared by the electrolysis of their

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Identify the correct order of thermal stabilities.





**Answer: B**



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**10.** Alkali and alkaline earth metals have low ionisation enthalpies and hence exhibit characteristic flame colouration. They have high negative electrode potentials and hence are strong reducing agents. They dissolve in liquid ammonia to give a solution which conducts electricity and act as strong reducing agent. being stronger reducing agent than hydrogen, they are usually prepared by the electrolysis of their fused chlorides. Their oxides are basic and the basic strength increases down the group. The solubility of

carbonates and sulphates of alkali and alkaline earth metals show opposite trends. only the carbonates of *Li* and alkaline earth metals decompose on heating. The bicarbonates of both alkali and alkaline earth metals on heating give carbonates.

The compound insoluble in acetic acid is

- A. Calcium oxide
- B. Calcium carbonate
- C. Calcium oxalate
- D. Calcium hydroxide

**Answer: C**



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11. According to Fajans' rules, the percentage of covalent character in an ionic compound increase if the cation is highly charged or small in size and the anion is large or cation has pseudoinert gas configuration. As a result of the increased covalent character, solubility in less polar solvent increases and the melting point decreases.

Which of the following has the lowest melting point?

A. *KCl*

B. *LiCl*

C. *CsCl*

D.  $RbCl$

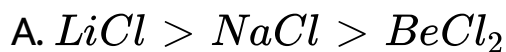
**Answer: B**



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**12.** According to Fajans' rules, the percentage of covalent character in an ionic compound increases if the cation is highly charged or small in size and the anion is large or the cation has a pseudo-inert gas configuration. As a result of the increased covalent character, solubility in less polar solvent increases and the melting point decreases.

The correct order of decreasing covalent character is



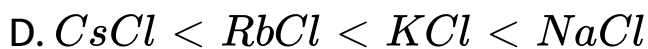
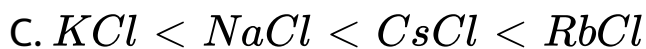
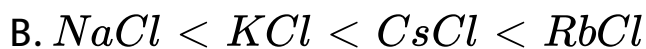
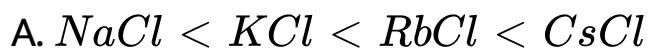
**Answer: B**



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**13.** According to Fajans' rules, the percentage of covalent character in an ionic compound increase if the cation is highly charged or small in size and the anion is large or cation has pseudoinert gas

configuration. As a result of the increased covalent character, solubility in less polar solvent increases and the melting point decreases. The correct order of increasing ionic character is



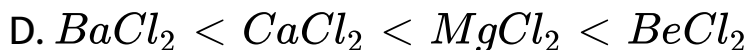
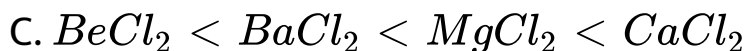
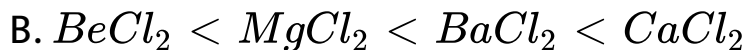
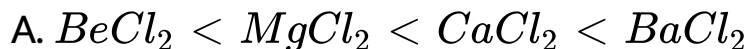
**Answer: A**



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The correct order of increasing ionic character is



**Answer: A**



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15. According to Fajans' rules, the percentage of covalent character in an ionic compound increase if the cation is highly charged or small in size and the anion is large or cation has pseudoinert gas configuration. As a result of the increased covalent character, solubility in less polar solvent increases and the melting point decreases.

Which of the following has highest melting point?

A. *LiCl*



B.  $\text{NaCl}$

C.  $\text{KCl}$

D.  $\text{RbCl}$

**Answer: D**

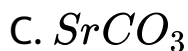
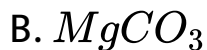
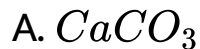


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**16.** A compound ( $A$ ) on heating in Bunsen flame imparts brick red colouration. ( $A$ ) on heating gives  $\text{CO}_2$  gas and a residue ( $B$ ). The residue ( $B$ ) when treated with water gives ( $C$ ). On passing an excess of  $\text{CO}_2$  through ( $C$ ) in water, a clear solution ( $D$ ) is obtained. On boiling ( $D$ ), compound ( $A$ ) is

reformed.

Compound (*A*) is



**Answer: A**



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17. A compound (*A*) on heating in Bunsen flame imparts brick red colouration. (*A*) on heating gives

$CO_2$  gas and a residue ( $B$ ). The residue ( $B$ ) when treated with water gives ( $c$ ). On passing an excess of  $CO_2$  through ( $C$ ) in water, a clear solution ( $D$ ) is obtained. On boiling ( $D$ ), compound ( $A$ ) is reformed.

Residue ( $B$ ) is

A.  $CaO$

B.  $CaO_2$

C.  $SrO$

D.  $BaO$

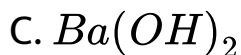
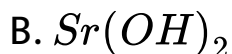
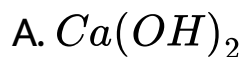
**Answer: A**

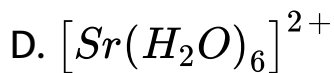


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Compound ( $C$ ) is





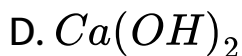
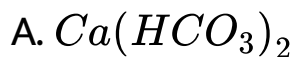
**Answer: A**



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**19.** A compound (*A*) on heating in Bunsen flame imparts brick red colouration. (*A*) on heating gives  $CO_2$  gas and a residue (*B*). The residue (*B*) when treated with water gives (*C*). On passing an excess of  $CO_2$  through (*C*) in water, a clear solution (*D*) is obtained. On boiling (*D*), compound (*A*) is reformed.

Compound (*D*) is



**Answer: A**



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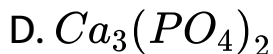
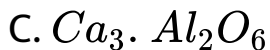
**20.** Cement is one of the most important building material of the present time. It is a dirty greyish heavy powder containing calcium aluminates and silicates. The important raw materials neede for the

manufacture of cement are limestone, clay and gypsum. the main step in the manufacture of cement is the heating of raw meal or slurr in the rotary kiln at a very high temperature  $1400 - 1600^{\circ}C$ . Finally 2% or 3% gypsum is added.

When cement is mixed with water and left as such for sometime, it becomes a hard mass. This is known as setting of cement. It is believed that varous aluminates and silicates present in the cement form hydrates with water which seperate in the form of gel. the gel formed start losing water partly by evaporation and partly by forming hydrates with unhydrated constituents. this results in the

formation of a hard mass.

Portland cement does not contain



**Answer: D**



**Watch Video Solution**

21. Cement is one of the most important building material of the present time. It is a dirty greyish



heavy powder containing calcium aluminates and silicates. The important raw materials needed for the manufacture of cement are limestone, clay and gypsum. The main step in the manufacture of cement is the heating of raw meal or slurry in the rotary kiln at a very high temperature  $1400 - 1600^{\circ}C$ . Finally 2% or 3% gypsum is added.

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unhydrated constituents. this results in the formation of a hard mass.

Setting of cement is

- A. Exothermic reaction
- B. Endothermic reaction
- C. Hydration process
- D. None of these

**Answer: A:C**



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**22.** Cement is one of the most important building material of the present time. It is a dirty greyish heavy powder containing calcium aluminates and silicates. The important raw materials needed for the manufacture of cement are limestone, clay and gypsum. The main step in the manufacture of cement is the heating of raw meal or slurry in the rotary kiln at a very high temperature  $1400 - 1600^{\circ}C$ . Finally 2% or 3% gypsum is added.

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gel. the gel formed start losing water partly by evaporation and partly by forming hydrates with unhydrated constituents. this results in the formation of a hard mass.

The percentage of lime in portland cement is approximately

A. 20 – 25 %

B. 30 – 45 %

C. 60 – 65 %

D. 40 – 50 %

**Answer: C**



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**23.** Cement is one of the most important building material of the present time. It is a dirty greyish heavy powder containing calcium aluminates and silicates. The important raw materials needed for the manufacture of cement are limestone, clay and gypsum. The main step in the manufacture of cement is the heating of raw meal or slurr in the rotary kiln at a very high temperature  $1400 - 1600^{\circ}C$ . Finally 2% or 3% gypsum is added.

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hydrates with water which separate in the form of gel. the gel formed start losing water partly by evaporation and partly by forming hydrates with unhydrated constituents. this results in the formation of a hard mass.

Concrete is a mixture of

- A. Cement, sand, gravel and water
- B. Cement, sand limestone and water
- C. Cement, slaked lime and water
- D. Cement, sand and water

**Answer: A**



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**24.** Cement is one of the most important building material of the present time. It is a dirty greyish heavy powder containing calcium aluminates and silicates. The important raw materials needed for the manufacture of cement are limestone, clay and gypsum. The main step in the manufacture of cement is the heating of raw meal or slurr in the rotary kiln at a very high temperature  $1400 - 1600^{\circ}C$ . Finally 2% or 3% gypsum is added.

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hydrates with water which separate in the form of gel. the gel formed start losing water partly by evaporation and partly by forming hydrates with unhydrated constituents. this results in the formation of a hard mass.

Gypsum is added to portland cement

- A. To fasten the process of setting
- B. To slow down the process of setting
- C. To improve the colour of the cement
- D. All of the above are incorrect

**Answer: B**



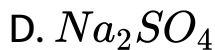
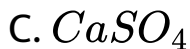
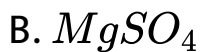
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25. Alkanline earth metal nitrate ( $A$ ) on heating decompose, leaving a solid residue ( $B$ ) which goes into solution with dilute  $HCl$ . The solution of ( $B$ ) gives a white precipitate ( $C$ ) is dissolved in dilute  $HCl$  and the solution is treated with potassium chromae to get yellow precipitate ( $D$ ). The solution ( $B$ ) with dilute  $H_2SO_4$  also gives a white precipitate ( $E$ ) insoluble in diute  $HCl$  and nitric acid. the precipitate ( $E$ ) is a part of a white pigment lithopone.

The compound ( $E$ ) is

A.  $BaSO_4$



**Answer: A**



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**26.** Alkanline earth metal nitrate (*A*) on heating decompose, leaving a solid residue (*B*) which goes into solution with dilute *HCl*. The solution of (*B*) gives a white precipitate (*C*) is dissolved in dilute *HCl* and the solution is treated with potassium chromae to get yellow precipitate (*D*). The solution

(B) with dilute  $H_2SO_4$  also gives a white precipitate (E) insoluble in dilute  $HCl$  and nitric acid. the precipitate (E) is a part of a white pigment lithopone.

The yellow precipitate (D) is



D. none of these

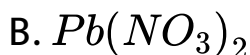
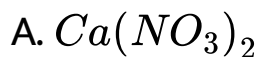
**Answer: B**

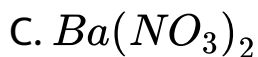


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27. Alkanline earth metal nitrate ( $A$ ) on heating decompose, leaving a solid residue ( $B$ ) which goes into solution with dilute  $HCl$ . The solution of ( $B$ ) gives a white precipitate ( $C$ ) is dissolved in dilute  $HCl$  and the solution is treated with potassium chromae to get yellow precipitate ( $D$ ). The solution ( $B$ ) with dilute  $H_2SO_4$  also gives a white precipitate ( $E$ ) insoluble in diute  $HCl$  and nitric acid. the precipitate ( $E$ ) is a part of a white pigment lithopone.

The metal nitrate ( $A$ ) is





**Answer: C**



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**28.** Alkanline earth metal nitrate ( $A$ ) on heating decompose, leaving a solid residue ( $B$ ) which goes into solution with dilute  $HCl$ . The solution of ( $B$ ) gives a white precipitate ( $C$ ) is dissolved in dilute  $HCl$  and the solution is treated with potassium chromae to get yellow precipitate ( $D$ ). The solution ( $B$ ) with dilute  $H_2SO_4$  also gives a white precipitate

(*E*) insoluble in dilute  $HCl$  and nitric acid. the precipitate (*E*) is a part of a white pigment lithopone.

The solid residue (*B*) is

A.  $CaO$

B.  $PbO$

C.  $ZnO$

D.  $BaO$

**Answer: D**



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29. Alkanline earth metal nitrate ( $A$ ) on heating decompose, leaving a solid residue ( $B$ ) which goes into solution with dilute  $HCl$ . The solution of ( $B$ ) gives a white precipitate ( $C$ ) is dissolved in dilute  $HCl$  and the solution is treated with potassium chromae to get yellow precipitate ( $D$ ). The solution ( $B$ ) with dilute  $H_2SO_4$  also gives a white precipitate ( $E$ ) insoluble in diute  $HCl$  and nitric acid. the precipitate ( $E$ ) is a part of a white pigment lithopone.

The nitrate ( $A$ ) can be confirmed by flame test. The colour imparted by the salt to the Bunsen flame is

A. Yellow

B. Green

C. Blue

D. Red

**Answer: B**



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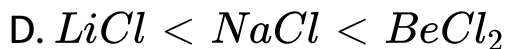
**30.** Both alkali metals and alkaline earth metals are  $s$  – block elements. They resemble each other in many respects but still there are certain dissimilarities in their properties due to different number of electrons in the valence shell, different atomic radii, ionisation enthalpy, electronegativity,



etc.

Like lithium, Be also differs from rest of the alkaline earth metals on account of its small atomic size and high electronegativity.  $Be^{2+}$  ion is very small and exerts a high polarising effect on any anion associated with it.

The correct sequence of increasing covalent character is



**Answer: B**



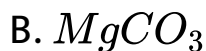
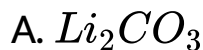
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**31.** Both alkali metals and alkaline earth metals are *s* – block elements. They resemble each other in many respects but still there are certain dissimilarities in their properties due to different number of electrons in the valence shell, different atomic radii, ionisation enthalpy, electronegativity, etc.

Like lithium, Be also differs from rest of the alkaline earth metals on account of its small atomic size and high electronegativity.  $Be^{2+}$  ion is very small and

exerts a high polarising effect on any anion associated with it.

Which is least thermally stable?



**Answer: B**



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**32.** Both alkali metals and alkaline earth metals are  $s$  – block elements. They resemble each other in many respects but still there are certain dissimilarities in their properties due to different number of electrons in the valence shell, different atomic radii, ionisation enthalpy, electronegativity, etc.

Like lithium, Be also differs from rest of the alkaline earth metals on account of its small atomic size and high electronegativity.  $Be^{2+}$  ion is very small and exerts a high polarising effect on any anion associated with it.

Which of the following statements are true for group 2 elements?

- A. Lattice enthalpy of oxides, carbonates, fluorides decreases from *Be* to *Ba*.
- B. All form nitrides in air.
- C. The solubility of the hydroxides increases from *Be* to *Ba*.
- D. All are correct.

**Answer: D**



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**33.** Both alkali metals and alkaline earth metals are *s* – block elements. They resemble each other in

many respects but still there are certain dissimilarities in their properties due to different number of electrons in the valence shell, different atomic radii, ionisation enthalpy, electronegativity, etc.

Like lithium, Be also differs from rest of the alkaline earth metals on account of its small atomic size and high electronegativity.  $Be^{2+}$  ion is very small and exerts a high polarising effect on any anion associated with it.

The alkaline earth metal which does not directly combine with hydrogen is

A. *Be*

B. *Ca*

C. *Sr*

D. *Ba*

**Answer: A**



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**34.** Both alkali metals and alkaline earth metals are *s* – block elements. They resemble each other in many respects but still there are certain dissimilarities in their properties due to different number of electrons in the valence shell, different atomic radii, ionisation enthalpy, electronegativity, etc.

Like lithium, Be also differs from rest of the alkaline earth metals on account of its small atomic size and high electronegativity.  $Be^{2+}$  ion is very small and exerts a high polarising effect on any anion associated with it.

The solubility in water of sulphates down the group ( $\downarrow$ ) is  $Be > Mg > Ca > Sr > Ba$ . this is due to

- A. Increases in melting point
- B. Increases in molecular mass
- C. Decreases in lattice enthalpy
- D. High heat of solvation for smaller ions

**Answer: D**



**35.** Both alkali metals and alkaline earth metals are  $s$  – block elements. They resemble each other in many respects but still there are certain dissimilarities in their properties due to different number of electrons in the valence shell, different atomic radii, ionisation enthalpy, electronegativity, etc.

Like lithium, Be also differs from rest of the alkaline earth metals on account of its small atomic size and high electronegativity.  $Be^{2+}$  ion is very small and exerts a high polarising effect on any anion associated with it.

Which of the bicarbonate does not exist in solid state?



**Answer: C**



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**36.** Both alkali metals and alkaline earth metals are  $s$  – block elements. They resemble each other in

many respects but still there are certain dissimilarities in their properties due to different number of electrons in the valence shell, different atomic radii, ionisation enthalpy, electronegativity, etc.

Like lithium, Be also differs from rest of the alkaline earth metals on account of its small atomic size and high electronegativity.  $Be^{2+}$  ion is very small and exerts a high polarising effect on any anion associated with it.

The element which does not directly combine with carbon on strong heating:

A. *Li*

B. *Be*

C.  $K$

D.  $Ca$

**Answer: C**



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**37.** Limestone is a naturally occurring form of calcium carbonate. It is used as building materials and also for manufacture of other building materials such as portland cement. It is used for the production of quicklime and slaked lime which have wide applications in chemical, metallurgical and construction industry. The pure  $CaCO_3$ , called

precipitated calcium carbonate, is used extensively as filler, providing bulk to materials such as paint, plastics, printing inks and rubber. It is also used in toothpastes, cosmetics and antacids. Quicklime and slaked lime are the cheapest and the most widely used bases for neutralising unwanted acids. Lime is used to neutralise acidic soils. An important application of quicklime is in air pollution control for the removal of  $SO_2$  in electric power plants. Slaked lime is used in the manufacture of other alkalis and bleaching powder, in sugar refining, in tanning hide and in water softening.

The substance not likely to contain  $CaCO_3$  is

A. Dolomite

B. A marble statue

C. Sea shells

D. Calcined gypsum

**Answer: D**

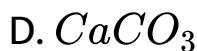


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**38.** Limestone is a naturally occurring form of calcium carbonate. It is used as building materials and also for manufacture of other building materials such as portland cement. It is used for the production of quicklime and slaked lime which have wide applications in chemical, metallurgical and

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Slaked lime reacts with chlorine to give



**Answer: C**



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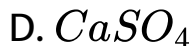
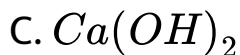
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in water softening.

Quiclime is



**Answer: A**



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**40.** Limestone is a naturally occurring form of calcium carbonate. It is used as building materials and also

for manufacture of other building materials such as portland cement. It is used for the production of quicklime and slaked lime which have wide applications in chemical, metallurgical and construction industry. The pure  $CaCO_3$ , called precipitated calcium carbonate, is used extensively as filler, providing bulk to materials such as paint, plastics, printing inks and rubber. It is also used in toothpastes, cosmetics and antacids. Quicklime and slaked lime are the cheapest and the most widely used bases for neutralising unwanted acids. Lime is used to neutralise acidic soils. An important application of quicklime is in air pollution control for the removal of  $SO_2$  in electric power plants. Slaked

lime is used in the manufacture of other alkalis and bleaching powder, in sugar refining, in tanning hide and in water softening.

The drying agent which absorbs  $CO_2$  and reacts violently with water is

A. Sodium carbonate

B. Quicklime

C. Conc  $H_2SO_4$

D. Alcohol

**Answer: B**

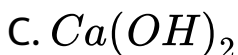
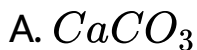


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Chemical compound (A) is used to remove temporary hardness from water. It reacts with  $Na_2CO_3$  to generate caustic soda. when  $CO_2$  is passed through (A) it turns cloudy. What is (A)?



**Answer: C**

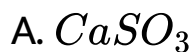


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Quicklime is used in electric power plants with carbon to check pollution. What product of calcium is formed?





C.  $CaS$

D.  $CaSO_4 \cdot 10H_2O$

**Answer: A**



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## Exercises Multiple Correct

1. Which of the following *is/are* example (s) if duagibak pairs?

A.  $Li$  and  $Na$

B.  $Li$  and  $Be$

C. *Li* and *Mg*

D. *Be* and *Al*

**Answer: C::D**



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2. Sodium sulphate is soluble in water but barium sulphate is sparingly soluble because

A. The hydration enthalpy of  $Na_2SO_4$  is more than its lattice enthalpy.

B. The lattice enthalpy of  $BaSO_4$  is more than its hydration enthalpy.

C. The lattice enthalpy has no role to play in solubility.

D. The lattice enthalpy of  $Na_2SO_4$  is more than its hydration enthalpy.

**Answer: A::B**



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**3. Which of the following statements are false?**

- A.  $BeCl_2$  exists as dimer in the vapour state and polymeric in the solid state.
- B. Calcium hydride is called hydrolith.
- C. The oxides of  $Be$  and  $Ca$  are amphoteric.
- D. Bicarbonates of  $Na$  and  $Sr$  are insoluble in water.

**Answer: C::D**



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4. Which of the following elements form peroxides when heated in excess of air?

A.  $K$

B.  $Na$

C.  $Ba$

D.  $Ca$

**Answer: B::C::D**



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5. The alkaline earth metals forming ionic oxides are

A.  $BeO$

B.  $MgO$

C.  $CaO$

D.  $SrO$

**Answer: B::C::D**



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6. Which of the following groups of elements have properties that are most similar?

A.  $Sr$

B.  $Ca$

C.  $Ba$

D. *Be*

Answer: A::B::C



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7. Which of the following groups of elements have properties that are most similar?

A. *Na, K, Cs*

B. *Mg, Sr, Ba*

C. *Be, Al, Ca*

D. *Be, Ra, Cs*

**Answer: A::B::C**



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8. Magnesium burns in the atmosphere of the following gases?

A.  $CO_2$

B.  $N_2O$

C.  $N_2$

D.  $SO_2$

**Answer: A::B::C::D**



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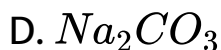
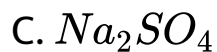
9. Which of the following properties show a reverse trend in moving down the group of alkali and alkaline earth metals?

- A. Solubility of hydroxides
- B. Solubility of carbonates
- C. Solubility of sulphates
- D. Solubility of oxides

**Answer: B::C**



10. In which of the following, hydration enthalpy is greater than the lattice enthalpy?



**Answer: C::D**



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11. Which of the following statements (s) is/are not true about the diagonal relationship of *Be* and *Al*?

- A. Their oxides are basic
- B. They become passive by conc  $HNO_3$
- C. Both react with  $NaOH$  to liberate hydrogen
- D. Their carbides give acetylene on hydrolysis

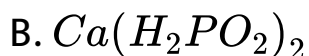
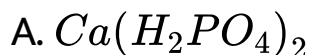
**Answer: A::D**



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12. yellow phosphorus on reaction with  $Ca(OH)_2$

gives:

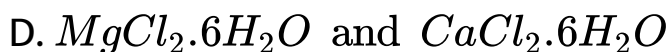
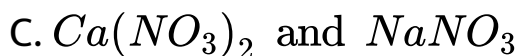
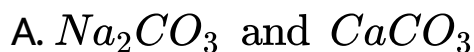


**Answer: A:C**



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13. Which of the following pairs can be distinguished by the action of heat?



**Answer: A::B**



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14. The hydration enthalpy of  $Mg^{2+}$  ion is higher than that of



**Answer: C::D**



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15. Which among the following has the tendency to form covalent compounds?

A. *Li*

B. *Be*

C. *Sr*

D. *Mg*

**Answer: A::B**



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16. Identify the correct statement(s).

A. Gypsum contains a lower percentage of calcium than plaster of paris.

B. Gypsum is  $CaSO_4 \cdot 2H_2O$ .

C. Plaster of paris is obtained by hydration of gypsum.

D. Gypsum is obtained by hydration of plaster of paris.

**Answer: A::B::D**



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**17. Select the correct statements about barium:**



A. It shows photoelectric effect.

B. It is silvery white metal.

C. It forms  $Ba(NO_3)_2$  which is used in preparation of green fire.

D. Its ionisation enthalpy is less than radium.

**Answer: B::C::D**



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**18.** Which of the following oxides have rock salt structure with coordination number 6: 6?

A.  $BeO$

B.  $MgO$

C.  $CaO$

D.  $SrO$

**Answer: B::C::D**



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**19.**  $Mg$  and  $Zn$  have the following resemblance:

A.  $MgO$  and  $ZnO$  are amphoteric.

B.  $MgCO_3$  and  $ZnCO_3$  both on heating give corresponding oxide.

C. Both are used as electrodes.

D. Both are used as electrodes.

**Answer: B::C::D**

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20. *Be* and *Al* have the following resemblance due to diagonal relationship,

A. Have nearly equal electronegativity

B. Form amphoteric oxides

C. Have same charge/radius ration

D. Both form dimeric halides

**Answer: A::B::C::D**



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**21.** The correct statement(*s*)*is / are*

A.  $BeCl_2$  is a covalent compound

B.  $BeCl_2$  can form dimer

C.  $BeCl_2$  is an electron-deficient molecule

D. The hybrid state of *Be* in  $BeCl_2$  is  $sp^2$

**Answer: A::B::C**



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**22.** Which of the following metal(s) do (es) not give characteristic flame colouration?

A. *Ca*

B. *Mg*

C. *Be*

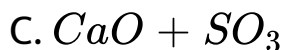
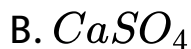
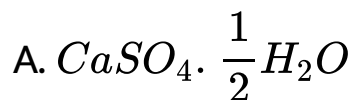
D. *Na*

Answer: B::C



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23. Gypsum on heating gives



Answer: A::B::C



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24. Dolomite is a mineral of

- A. Aluminium
- B. Magnesium
- C. Calcium
- D. Potassium

**Answer: B::C**



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25.  $Mg^{2+}$  can be detected and estimated in hard water by titrating with *EDTA* at  $pH = 10$  using  $NH_4OH + NH_4Cl$  buffer. The end point is given by the appearance of blue colour. The indicator used is

- A. Solochrome black
- B. Eriochrome black *T*
- C. Eosin
- D. Bromophenol

**Answer: A::B**



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1. Berllium shows diagonal relationship with

A.  $Mg$

B.  $Na$

C.  $Al$

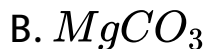
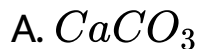
D.  $B$

**Answer: C**



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2. Dolomite is mineral whose formula is



**Answer: C**



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3. The ionisation enthalpy of alkaline earth metals is

A. Greater than alkali metals but less than elements of group 13

B. less than alkali metals

C. Greater than elements of groups 1 and 13

D. Equal to alkali metals

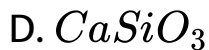
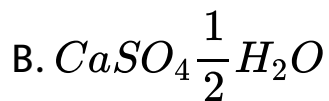
**Answer: C**



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4. Formula of gypsum salt is

A.  $CaSO_4 \cdot 2H_2O$



**Answer: A**



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5.  $CaC_2$  reacts with water to give

A. Methane

B. Ethane

C. Ethylene

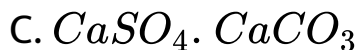
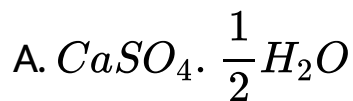
D. Acetylene

**Answer: D**



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6. Plaster of paris is



**Answer: A**



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7. Mixture of  $CaCN_2$  and  $C$  is called

A. Barytes

B. Anhydrite

C. Nitrolim

D. Iceland spar

**Answer: C**



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8. Lithopone is a mixture of

A.  $BaSO_4$  and  $BaS$

B.  $BaSO_4$  and  $ZnS$

C.  $BaO$  and  $ZnS$

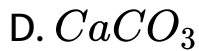
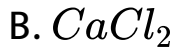
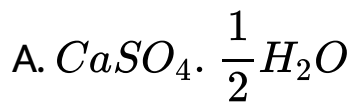
D.  $BaCO_3$  and  $ZnO$

**Answer: B**



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9. Slaked lime is obtained when water is added to



**Answer: C**



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**10. Which of the following is not present in cement ?**

A. Gypsum

B. Clay



C. Almina

D. Alum

**Answer: D**



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**11.** Out of the following metals that cannot be obtained by electrolysis of the aqueous solution of their salts is

A. *Ag*

B. *Mg*

C. *Cu*

D. *Au*

**Answer: B**



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**12.** An important ore of magnesium is

A. Malachite

B. Cassiterite

C. Carnallite

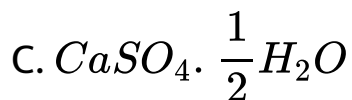
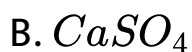
D. Galena

**Answer: C**



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13. Gypsum on heating to  $390K$  gives

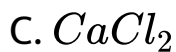
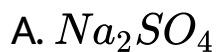


Answer: C



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14. Ripening of fruits can be carried out in presence of



**Answer: D**



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15. The drying agent which absorbs carbon dioxide and reacts violently with water is

A. Sodium carbonate

B. Alcohol

C. Conc  $H_2SO_4$

D. Calcium oxide

**Answer: D**



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16. Calcium is obtained by the

A. Roasting of limestone

B. Electrolysis of a solution of calcium chloride in water

C. Reduction of calcium chloride with carbon

D. Electrolysis of molten anhydrous calcium chloride

**Answer: D**



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17. The difference of number of water molecules in gypsum and plaster of Paris is

A.  $\frac{5}{1}$

B. 2

C.  $\frac{1}{2}$

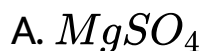
D.  $1\frac{1}{2}$

**Answer: D**



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**18.** Which of the following compound is most soluble in water?





**Answer: A**



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**19.**  $Ca^{2+}$  is isoelectronic with





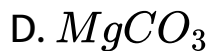
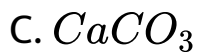


**Answer: C**



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**20.** Which of the following decomposes at highest temperature?



**Answer: B**



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**21.** Which of the following electronic configuration in the outermost two shells is characteristic of the alkaline earth metals?

A.  $(n - 1)s^2p^6ns^2$

B.  $(n - 1)s^2p^6d^{10}ns^2$

C.  $(n - 1)s^2p^2ns^2p^1$

D. none of these

**Answer: D**



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22. When a substance  $A$  reacts with water it produces a combustible gas  $B$  and a solution of substance  $C$  in water. When another substance  $D$  reacts with this solution of  $C$ , it also produces the same gas  $B$  on warming but  $D$  can produce  $B$  on reaction with dilute sulphuric acid at room temperature.  $B$  on reaction with dilute sulphuric acid at room temperature.  $A$  imparts a golden yellow colour to a smokeless flame of bunsen flame.  $A$ ,  $B$ ,  $C$  and  $D$  are respectively.

A.  $K$ ,  $H_2$ ,  $KOH$ ,  $Al$

B.  $\text{NaH}_2$ ,  $\text{NaOH}$ ,  $\text{Zn}$

C.  $\text{CaC}_2$ ,  $\text{C}_2\text{H}_2$ ,  $\text{Ca(OH)}_2$ ,  $\text{Fe}$

D.  $\text{Ca}$ ,  $\text{H}_2$ ,  $\text{Ca(OH)}_2$ ,  $\text{Sn}$

**Answer: B**

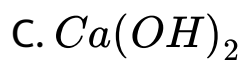


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**23.** The basic strength of which hydroxide is maximum

A.  $\text{LiOH}$

B.  $\text{NaOH}$

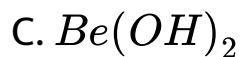
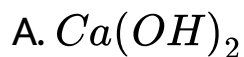


**Answer: D**



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**24.** Of the following , and amphoteric hydroxide is



Answer: C



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25. The following compounds have been arranged in order of their increasing stabilities. Identify the correct order.

(I)  $K_2CO_3$  (II)  $MgCO_3$

(III)  $CaCO_3$  (IV)  $BeCO_3$

A.  $I < II < III < IV$

B.  $IV < II < III < I$

C.  $IV < II < I < III$

D.  $II < IV < III < I$

**Answer: B**



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**26.** Magnesium combines with nitrogen to form a nitride, which reacts with water to form a colourless gas. The gas is

A.  $NH_3$

B.  $N_2O$

C.  $NO$

D.  $N_2O$

**Answer: A**



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27. Which has the highest electronegativity?

A. *Li*

B. *Be*

C. *Mg*

D. *Na*

**Answer: B**



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28. Which of the following undergoes disproportionation?

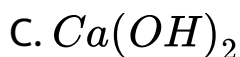
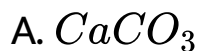


**Answer: B**



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29. Which of the following is insoluble in acetic acid?



**Answer: B**



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30. Which of the following fluoride is more soluble in water?

A.  $BaF$

B.  $BeF_2$

C.  $MgF_2$

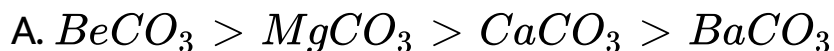
D.  $CaF_2$

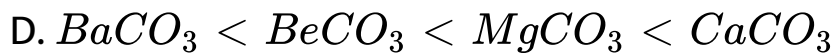
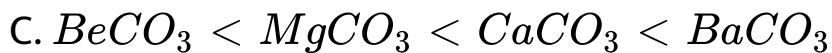
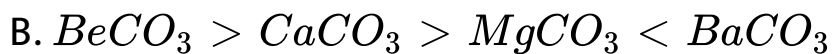
**Answer: B**



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**31.** Solubility of alkaline earth metal carbonates in water is as follows:



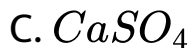


**Answer: A**



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**32. Epsom salt is**





**Answer: A**



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**33.** Which of the following alkaline earth metal oxide is most basic?

A.  $BeO$

B.  $MgO$

C.  $CaO$

D.  $BaO$

**Answer: D**



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**34.** Which of the following metal reacts with cold  $H_2O$  with the evolution of  $H_2$  gas?

A. *Ca*

B. *Al*

C. *Zn*

D. *Cu*

**Answer: A**



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35. Which of the following salt will give a green colour in fire works?

A. *Ca*

B. *Ba*

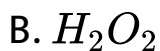
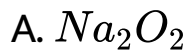
C. *Mg*

D. *Sr*

**Answer: B**

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36. Which of the following does not contain the true peroxide ion?



**Answer: B**



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37. The most abundant alkaline earth metal in the earth's crust is



A. *Be*

B. *Mg*

C. *Ca*

D. *Sr*

**Answer: C**



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**38.** The hydration enthalpy of  $Mg^{2+}$  is greater than

A.  $Al^{3+}$

B.  $Na^{\oplus}$

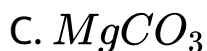
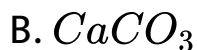


**Answer: B**



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**39.** Which of the following alkaline earth metal carbonate is thermally least stable?



D.  $BaCO_3$

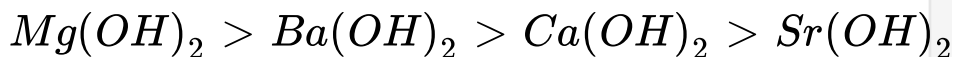
**Answer: A**



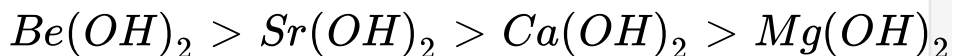
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**40.** The basic character of the alkaline earth metal hydroxides is as follows:

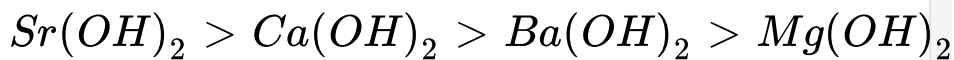
A.



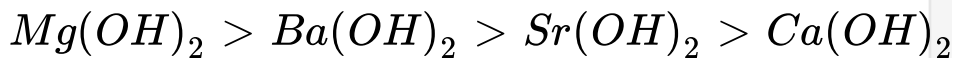
B.



C.



D.

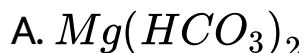


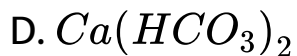
**Answer: B**



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**41.** Which of the following bicarbonate is insoluble in water?





**Answer: B**



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**42.** Which of the following metal is the most difficult to extract from its oxide?



C. *Mg*

D. *Ag*

**Answer: A**



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**43.** The most probable reason that the alkaline earth metals give dipositive ions instead of unipositive ion is

A. The compounds with  $+2$  oxidation state have more lattice enthalpy than those with  $+1$  oxidation state.

B. The values of their first and second ionisation potential are not very much different.

C. The dipositive ion has greater charge than the unipositive ion.

D. The compounds of +1 oxidation state of these metals are not stable.

**Answer: A**



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**44.** The oxidation states of the most electronegative elements in the products of the reaction between

$BaO_2$  and  $H_2SO_4$  are

A. 0 and  $-1$

B.  $-1$  and  $-2$

C.  $-2$  and 0

D.  $-2$  and  $+1$

**Answer: B**



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**45.** Anhydrous  $MgCl_2$  is obtained by heating hydrate salt,  $MgCl_2 \cdot 6H_2O$ .



A. Strongly in air

B. In presence of coke

C. In presence of conc  $H_2SO_4$  which absorbs  
moisture

D. In presence of dry  $HCl$  gas

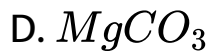
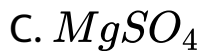
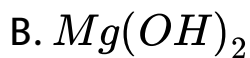
**Answer: D**



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**46.** Which of the following is used as an antacid?

A.  $MgO$



**Answer: B**



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47. Typical elements is the name given to the elements of

A. Zero group

B. Group 2

C. 2<sup>nd</sup> and 3<sup>rd</sup> period

D. Group 1

**Answer: B**



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**48.**  $Na_2SO_4$  is soluble in water whereas  $BaSO_4$  is sparingly soluble because

A. The lattice enthalpy of  $Na_2SO_4$  is less than its hydration enthalpy.

B. Sodium is monovalent ion whereas barium is a divalent ion.

C. The hydration enthalpy of sodium sulphate is less than its lattice enthalpy.

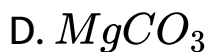
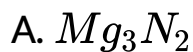
D. The lattice enthalpy of barium sulphate is less than its hydration enthalpy.

**Answer: A**



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**49.** *Mg* burns in air to give

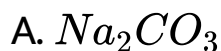


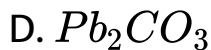
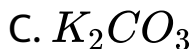
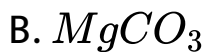
**Answer: C**



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50. Which of the following is decomposed on heating?





**Answer: B**



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**51.** Two metals ( $A$ ) and ( $B$ ) belong to the same group of the periodic table. Metal ( $A$ ) forms an insoluble oxide but a soluble sulphate, metal ( $B$ ) forms a soluble oxide but an insoluble oxide but an insoluble sulphate. Both metals ( $A$ ) and ( $B$ ) form

hydroxides which are soluble in alkalis. (*A*) and (*B*) are

A. *Ba* and *Mg*

B. *Na* and *K*

C. *Mg* and *Ba*

D. *K* and *Rb*

**Answer: C**



**Watch Video Solution**

**52.** Which of the following forms covalent compound?

A. *Be*

B. *Mg*

C. *Ca*

D. *Sr*

**Answer: A**



**Watch Video Solution**

**53.** The compounds of alkaline earth metals have the following magnetic nature:

A. Diamagnetic



B. Antiferromagnetic

C. Ferromagnetic

D. Paramagnetic

**Answer: A**



**Watch Video Solution**

**54.** For two ionic solids,  $CaO$  and  $KI$ , which of the following statements is false?

A. Lattice enthalpy of  $CaO$  is much higher than that of  $KI$ .

B.  $CaO$  has high melting point.

C.  $KI$  has low melting point.

D.  $KI$  is soluble in benzene.

**Answer: D**



**Watch Video Solution**

55. Which of the following substance can be used for drying neutral or basic gases?

A.  $Na_2CO_3$

B.  $CaCO_3$

C.  $CaO$

D.  $Na_2CO_3$

**Answer: C**



**Watch Video Solution**

**56.** As the nuclear charge increases from neon to calcium, the orbital energies

A. Increase

B. Increases very rapidly

C. increases very slowly

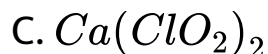
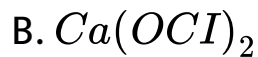
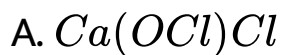
D. Fall

Answer: D



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57. Which one is the active constituent of bleaching powder?



**Answer: B**



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**58.** Bleaching powder loses its power on keeping for a long time because

- A. It absorbs moisture
- B. It changes into calcium hypochlorite
- C. It changes into calcium and calcium chlorate
- D. It cahnges salt of calcium chloride and calcium hydroxide

**Answer: B**



**Watch Video Solution**

59. A sodium salt of unknown anion when treated with  $MgCl_2$  gives a white *ppt.* On boiling. The anion is

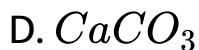
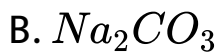


**Answer: A**



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60. Which of the following on thermal decomposition yields a basic as well as an acidic oxide?



Answer: D



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**61.** Limestone is a naturally occurring form of calcium carbonate. It is used as building materials and also for manufacture of other building materials such as portland cement. It is used for the production of quicklime and slaked lime which have wide applications in chemical, metallurgical and construction industry. The pure  $CaCO_3$ , called precipitated calcium carbonate, is used extensively as filler, providing bulk to materials such as paint, plastics, printing inks and rubber. It is also used in toothpastes, cosmetics and antacids. Quicklime and slaked lime are the cheapest and the most widely used bases for neutralising unwanted acids. Lime is used to neutralise acidic soils. An important



application of quicklime is in air pollution control for the removal of  $SO_2$  in electric power plants. slaked lime is used in the manufacture of other alkalis and bleaching powder, in sugar refining, in tanning hide and in water softening.

The substance not likely to contain  $CaCO_3$  is

- A. Dolomite
- B. A marble statue
- C. Calcined gypsum
- D. Sea shells

**Answer: A**



**Watch Video Solution**

62. One mole of magnesium nitride on reaction with an excess of water gives

A. One mole of  $NH_3$

B. Two moles of  $NH_3$

C. One mole of  $HNO_3$

D. Two moles of  $HNO_3$

**Answer: B**



**Watch Video Solution**

63. *Be* and *Al* exhibit many properties which are similar. But the two elements differ in

- A. Forming covalent bonds
- B. Forming polymeric hydrides
- C. Exhibiting maximum covalency in compounds
- D. Exhibiting amphoteric nature in their oxides

**Answer: C**



**Watch Video Solution**

64. Magnesium is an important component of which biomolecule occurring extensively in living world?

A. Haemoglobin

B. *ATP*

C. Chlorophyll

D. Vitamin  $B_{12}$

**Answer: C**



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65. Several blocks of magnesium are fixed to the bottom of a ship to

- A. Prevent action of water and salt
- B. Prevent puncturing by under sea rocks
- C. keep away the sharks
- D. Make the ship lighter

**Answer: A**



**Watch Video Solution**

66. The name and formula of the compound of magnesium, chlorine and oxygen used as a drying agent is

A. Magnesium oxychlorite,  $Mg(OCl)_2$

B. Magnesium chlorate,  $Mg(ClO_3)_2$

C. Magnesium chlorate,  $Mg(ClO_4)_2$

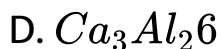
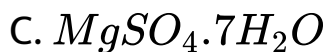
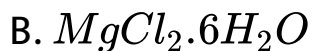
D. None of the above

**Answer: C**



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67. Salt used as a purgative is



Answer: C



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68. A compound ( $A$ ) gives brick red flame and breaks down on heating giving oxygen and brown gas. ( $A$ )

is

A.  $Na$  and  $Na_2O_2$

B.  $Ba$  and  $BaO_2$

C.  $Ca$  and  $CaH_2$

D.  $Ca$  and  $CaO$

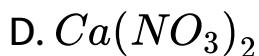
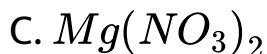
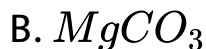
**Answer: C**



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**69.** Which of the following pair of substance give same gaseous product on reaction with water?





**Answer: C**



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**70.** An alkaline earth metal gives a salt with chlorine which is sparingly soluble in water at room temperature but fairly soluble in boiling water. It also forms a sulphate whose mixture with a sulphate of a

transition metal is called 'lithopone' and is used as white pigment. the alkaline earth metal is

A. *Ca*

B. *Mg*

C. *Sr*

D. *Ba*

**Answer: D**



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**71.** The metal that is extracted from sea water is

A. *Mg*

B. *Ca*

C. *Be*

D. *Ba*

**Answer: A**



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**72.** The element which shows radioactivity is

A. *Mg*

B. *Sr*

C. *Ba*

D. *Ra*

**Answer: D**



**Watch Video Solution**

**73.** Magnesium wire burns in the atmosphere of  $CO_2$  because

A. Magnesium acts as an oxidising agent

B. magnesium has two electrons in the outermost orbital

C. Magnesium acts as a reducing agent and removes oxygen from  $CO_2$

D. None of the above

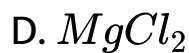
**Answer: C**

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**74.** Silica reacts with magnesium to form magnesium compound ( $X$ ). ( $X$ ) reacts with dilute  $HCl$  and forms ( $Y$ ).

A.  $MgO$

B.  $MgSiO_3$

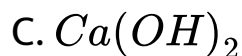
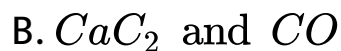


**Answer: D**



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75. On strong heating of  $CaO$  and  $C$ , the products formed are



D.  $CaC_2$  and  $CO_2$

**Answer: B**



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**76.** The nature of the oxide of radium is

A. Basic

B. Acidic

C. Neutral

D. Amphoteric

**Answer: B**



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77. Radium is obtained from

A. Limestone

B. Rutile

C. Pitchblende

D. Barytes

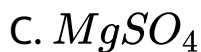
**Answer: C**



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78. Which of the following is used for taking the  $X$  – ray spectra of the digestive system:



**Answer: B**



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79. Among the given statements, the incorrect one is

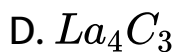
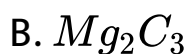
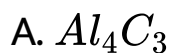
- A. Be differs much from other alkali metals than *Li* does from other alkali metals.
- B. Be generally forms covalent compounds.
- C. Be forms a very strong complex,  $[Be(H_2O)_4]^{2+}$ .
- D. Be usually has more than four water of crystallisation associated with it.

**Answer: D**



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80. Which of the following gives propyne on hydrolysis?

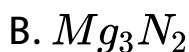
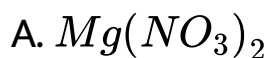


**Answer: B**



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81. A metal  $X$  on heating in nitrogen gas gives  $Y$ ,  $Y$  on treatment with  $H_2O$  gives a colourless gas which when passed through  $CuSO_4$  solution gives a blue colour.  $Y$  is:

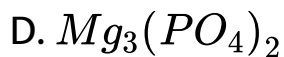
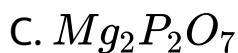


**Answer: B**



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82.  $Mg$  is precipitated and estimated gravimetrically as:



**Answer: C**



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**Exercises Assertion Reasoning**

1. Assertion (A): Magnesium does not impart any characteristic colour to the flame.

Reason (R ): Due to small size and high effective nuclear charge, magnesium requires a large amount of energy for excitation of electrons.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If (A) is incorrect, but (R) is correct.

**Answer: A**



**Watch Video Solution**

2. Assertion (A): Alkaline earth metals are harder than alkali metals.

Reason (R ): Atomic radii of alkaline earth metals are smaller than the corresponding alkali metals in the same period.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both ( $A$ ) and ( $R$ ) are correct, but ( $R$ ) is not the correct explanation of ( $A$ ).

C. If ( $A$ ) is correct, but ( $R$ ) is incorrect.

D. If ( $A$ ) is incorrect, but ( $R$ ) is correct.

**Answer: C**



**Watch Video Solution**

**3. Assertion (A):** Beryllium compounds are covalent in nature.

**Reason (R ):** The size of  $Be^{2+}$  ion is larger in



compariso to the radii of the other divalent ions of alkaline earth metals.

- A. If both ( $A$ ) and ( $R$ ) are correct and ( $R$ ) is the correct explanation of ( $A$ ).
- B. If both ( $A$ ) and ( $R$ ) are correct, but ( $R$ ) is not the correct explanation of ( $A$ ).
- C. If ( $A$ ) is correct, but ( $R$ ) is incorrect.
- D. If ( $A$ ) is incorrect, but ( $R$ ) is correct.

**Answer: C**



**Watch Video Solution**

4.  $BeSO_4$  is soluble in water but  $BaSO_4$  is insoluble.

Reason (R ): Lattice enthalpy of  $BaSO_4$  exceeds its hydration enthalpy.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If (A) is incorrect, but (R) is correct.

**Answer: A**



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5. Assertion (A): magnesium keeps on burning in  $CO_2$

Reason (R ): Magnesium reduces  $CO_2$  to C.

- A. If both (A) and (R) are correct and (R) is the correct explanation of (A).
- B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).
- C. If (A) is correct, but (R) is incorrect.
- D. If (A) is incorrect, but (R) is correct.

**Answer: A**



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6. Be forms  $[BeF_4]^{2-}$ , but Al forms  $[AlF_6]^{3-}$ .

Reason (R ): Be does not have  $d$ -orbitals in the valence shell but Al has.

- A. If both (A) and (R) are correct and (R) is the correct explanation of (A).
- B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).
- C. If (A) is correct, but (R) is incorrect.
- D. If (A) is incorrect, but (R) is correct.

**Answer: A**



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7. Assertion (A): Magnesium can be obtained by the electrolysis of aqueous solution of  $MgCl_2$ .

Reason (R ): The electrode potential of  $Mg^{2+}$  is much higher than  $H^{\oplus}$ .

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If (A) is correct, but (R) is incorrect.

D. If (A) is incorrect, but (R) is correct.

Answer: D



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8. Assertion (A):  $Be$  and  $Mg$  impart characteristic colour to the flame.

Reason (R ): As compared to other alkaline earth metals, ionisation enthalpy of  $Be$  and  $Mg$  is low.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If ( $A$ ) is correct, but ( $R$ ) is incorrect.

D. If ( $A$ ) is incorrect, but ( $R$ ) is correct.

**Answer: D**



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**9. Assertion (A):** magnesium is not present in enamel of human teeth.

**Reason (R ):** Magnesium is an essential elements for biological functions of human beings.

A. If both ( $A$ ) and ( $R$ ) are correct and ( $R$ ) is the correct explanation of ( $A$ ).

B. If both ( $A$ ) and ( $R$ ) are correct, but ( $R$ ) is not the correct explanation of ( $A$ ).

C. If ( $A$ ) is correct, but ( $R$ ) is incorrect.

D. If ( $A$ ) is incorrect, but ( $R$ ) is correct.

**Answer: B**



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**10. Assertion (A):** Barium is not required for normal biological function in human beings.

**Reason (R):** Barium does not show variable oxidation states.



- A. If both ( $A$ ) and ( $R$ ) are correct and ( $R$ ) is the correct explanation of ( $A$ ).
- B. If both ( $A$ ) and ( $R$ ) are correct, but ( $R$ ) is not the correct explanation of ( $A$ ).
- C. If ( $A$ ) is correct, but ( $R$ ) is incorrect.
- D. If ( $A$ ) is incorrect, but ( $R$ ) is correct.

**Answer: B**



**Watch Video Solution**

**11.** Assertion ( $A$ ): Addition of  $nH_4OH$  to an aqueous solution of  $BaCl_2$  in the presence of excess of

$NH_4Cl$  precipitates  $Ba(OH)_2$ .

Reason (R):  $Ba(OH)_2$  is insoluble in water.

- A. If both (A) and (R) are correct and (R) is the correct explanation of (A).
- B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).
- C. If (A) is correct, but (R) is incorrect.
- D. If (A) is incorrect, but (R) is correct.

**Answer: D**



**Watch Video Solution**

12. Assertion (A):  $BaCO_3$  is more soluble in  $HNO_3$  than in water.

Reason (R): Carbonate is a weak base and reacts with  $H^{\oplus}$  ions to form strong acid causing barium salt to dissociate.

- A. If both (A) and (R) are correct and (R) is the correct explanation of (A).
- B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).
- C. If (A) is correct, but (R) is incorrect.
- D. If (A) is incorrect, but (R) is correct.

**Answer: A**



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**13.** Assertion (A): Sulphur is estimates as  $BaSO_4$  and not as  $MgSO_4$ .

Reason (R ): The ionic radius of  $Mg^{2+}$  is less than that of  $Ba^{2+}$

- A. If both (A) and (R) are correct and (R) is the correct explanation of (A).
- B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).
- C. If (A) is correct, but (R) is incorrect.
- D. If (A) is incorrect, but (R) is correct.

**Answer: B**



**Watch Video Solution**

**14.** Assertion (A):  $Na_2SO_4$  is soluble in water while  $BaSO_4$  is insoluble.

Reason (R ): Lattice enthalpy of  $BaSO_4$  exceeds its hydration enthalpy.

A. If both (A) and (R) are correct and (R) is the correct explanation of (A).

B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).

C. If ( $A$ ) is correct, but ( $R$ ) is incorrect.

D. If ( $A$ ) is incorrect, but ( $R$ ) is correct.

**Answer: A**



**Watch Video Solution**

**15. Assertion (A):** Calcium and magnesium oxides are not reduced by carbon.

**Reason (R ):** Calcium and magnesium oxides react with carbon to form their respected carbides.

A. If both ( $A$ ) and ( $R$ ) are correct and ( $R$ ) is the correct explanation of ( $A$ ).

B. If both ( $A$ ) and ( $R$ ) are correct, but ( $R$ ) is not the correct explanation of ( $A$ ).

C. If ( $A$ ) is correct, but ( $R$ ) is incorrect.

D. If ( $A$ ) is incorrect, but ( $R$ ) is correct.

**Answer: A**



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**16. Assertion (A):**  $Be(OH)_2$  is soluble in  $NaOH$ .

**Reason (R):**  $Be(OH)_2$  is amphoteric in nature.

- A. If both  $(A)$  and  $(R)$  are correct and  $(R)$  is the correct explanation of  $(A)$ .
- B. If both  $(A)$  and  $(R)$  are correct, but  $(R)$  is not the correct explanation of  $(A)$ .
- C. If  $(A)$  is correct, but  $(R)$  is incorrect.
- D. If  $(A)$  is incorrect, but  $(R)$  is correct.

**Answer: A**



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**17. Assertion (A):** In curing cement plasters, water is sprinkled from time to time.



Reason (R ): It converts sand into silicic acid.

- A. If both (A) and (R) are correct and (R) is the correct explanation of (A).
- B. If both (A) and (R) are correct, but (R) is not the correct explanation of (A).
- C. If (A) is correct, but (R) is incorrect.
- D. If (A) is incorrect, but (R) is correct.

**Answer: C**



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1. How many alkaline earth metals are known?



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2. How many water molecules are associated with Epsiom salt?



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3. Calcium carbide reacts with nitrogen and forms an important fertiliser, calcium cynamide. How much calcium cynamide is formed when 6.4g of calcium carbide is completely converted into cyanamide?



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4. Magnalium is an alloy of aluminium and magnesium. What is the percentage of magnesium in this alloy?



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5. Magnesium oxide when mixed with a saturated solution of  $MgCl_2$ , sets to a hard mass known as 'Sorel cement' is formed. The composition of Sorel cement is  $MgCl_2 \cdot nMgO \cdot xH_2O$ . What is the value of  $n$ ?



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6. How many water molecules are present as water of crystallisation in gypsum?



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## Exercises Fill In The Balanks

1. Alkaline earth metals are \_\_\_\_\_ reducing agents than alkali metals.



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2. Second ionisation energies of alkaline earth metals are \_\_\_\_\_ than that of corresponding alkali metals.

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3. Atomic size of calcium is \_\_\_\_\_ than that of potassium.

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4. Hydrolith is the common name of \_\_\_\_\_.

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5. Barium salts impart \_\_\_\_\_ colour to the flame.



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6. The most abundant alkaline earth metal is \_\_\_\_\_.



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7. In chlorophyll, the metal present is \_\_\_\_\_.



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8. Dead burnt plaster is \_\_\_\_\_.



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9. Suspension of slaked lime in water is called \_\_\_\_\_.



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10. Ordinary black board chalk is made up of \_\_\_\_\_.



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11. Calcium cyanamide reacts with steam to form \_\_\_\_\_ and \_\_\_\_\_.

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12. The mixture of  $MgCl_2$  and  $MgO$  is called \_\_\_\_\_.

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13. The formula of calcium cyanamide is \_\_\_\_\_.

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## Exercises True False

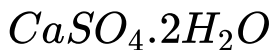
1. Beryllium resembles aluminium closely in the properties though it belongs to a different group.

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2. Alkaline earth metals have lower melting point than corresponding alkali metals.

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3. The chemical formula of plaster of paris is



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4.  $Ca_3(PO_4)_2$  is presents in bones.



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5.  $Ca^{2+}$  ions are important in blood clotting.



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6. Chlorophyll is a compound of calcium.



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7.  $3Ca_3(PO_4)_2 \cdot CaF_2$  is a part of enamel on teeth.



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8.  $BeH_2$  contains three centre two electron bond.



[View Text Solution](#)

9.  $CaH_2$  and  $BaH_2$  are covalent in nature.

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**10.** Beryllium hydride and magnesium hydride are covalent and polymeric.

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**11.** The process of setting of cement under water is essentially an oxidation process.

 [View Text Solution](#)

1. Sodium sulphate is soluble in water, whereas barium sulphate is sparingly soluble because

A. The hydration energy of sodium sulphate is more than its lattice energy.

B. The lattice energy of barium sulphate is more than its hydration energy.

C. The lattice energy has no role to play in solubility.

D. The hydration energy of sodium sulphate is less than its lattice energy.

Answer: A::B



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## Exercises Archives Single Correct

1. Calcium is obtained by

- A. Electrolysis of molten  $CaCl_2$
- B. Electrolysis of a solution of  $CaCl_2$  in water
- C. Reduction of  $CaCl_2$  with carbon
- D. Roasting of limestone

Answer: A



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2. The following compounds have been arranged in order of their increasing stabilities. Identify the correct order.

$K_2CO_3(I)$ ,  $MgCO_3(II)$ ,  $CaCO_3(III)$ ,  $BeCO_3(IV)$

A.  $I < II < III < IV$

B.  $IV < II < III < I$

C.  $IV < II < I < III$

D.  $II < IV < III < I$

**Answer: B**



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3. One mole of calcium phosphorus on reaction with excess water gives

- A.  $1\text{mol}$  of phosphine
- B.  $2\text{mol}$  of phosphoric acid
- C.  $2\text{mol}$  of phosphoric acid
- D.  $1\text{mol}$  of phosphoric pentoxide

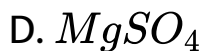
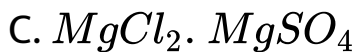
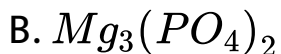
**Answer: C**



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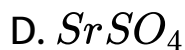
4.  $MgSO_4$  on reaction with  $NH_4OH$  and  $Na_2HPO_4$  forms a white crystalline. What is its formula?



**Answer: A**



5. Which one of the following alkaline earth metal sulphates has its hydration enthalpy greater than its lattice enthalpy?



**Answer: B**



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1. Anhydrous  $MgCl_2$  is obtained by heating hydrate salt with \_\_\_\_\_.

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Exercises Archives True Flase

1.  $MgCl_2 \cdot 6H_2O$  on heating gives anhydrous  $MgCl_2$ .

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Exercises Archives Subjective

1. Write down the balanced equations for the reaction when calcium phosphate is heated with a mixture of sand and carbon.



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2. Explain the following in one or two sentence only.

(a). Magnesium oxide is used for the lining of steel making furnace. (b). The molecule of beryllium chloride is linear, whereas that of stannous is angular.



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3. Arrange the following as stated:

Increasing order of basic character:

$MgO$ ,  $SrO_2$ ,  $K_2O$ ,  $NiO$ ,  $Cs_2O$ .



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4. Calcium burns in nitrogen to produce a white powder which dissolves insufficient water to produce a gas  $A$  and an alkaline solution. The solution on exposure to air produces a thin solid layer of  $b$  on the surface. Identify the compounds  $A$  and  $B$ .



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5. The crystalline salts of alkaline earth metals contain more water of crystallisation than the corresponding alkali metal salts. Why?

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6. Arrange the following sulphates of alkaline earth metals in order of decreasing thermal stability:

*BeSO<sub>4</sub>, MgSO<sub>4</sub>, CaSO<sub>4</sub>, SrSO<sub>4</sub>.*

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7. Work out the following using chemical equations:

'Chlorination of calcium hydroxide produces bleaching powder'.



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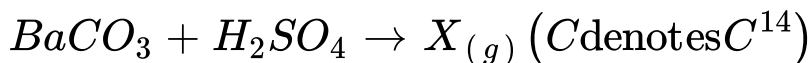
8. Give reasons for the following in one or two sentences only:

$BeCl_2$  can be easily hydrolysed'.



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9. Identify  $X$  in the following synthetic scheme and write their structures.



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### Ex 5 1 Subjective

1. Name an element which is invariably bivalent and whose oxide is soluble in excess of  $\text{NaOH}$  and its dipositive ion has a noble gas core.



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2. Differentiate between

a. quicklime b. limewater c. slaked lime



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3. How is plaster of paris prepared? Describe its chief property due to which it is widely used.



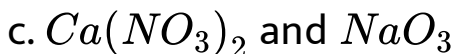
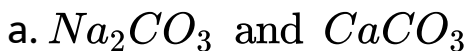
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4. Give reason for, ' $NaHCO_3$  is known in solid state but  $Ca(HCO_3)_2$  is not isolated in solid state.



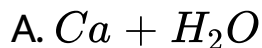
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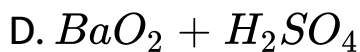
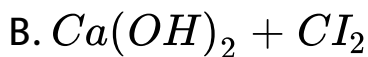
5. Contrast the action of heat on the following with reason:



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6. Complete the following equations for the reaction between



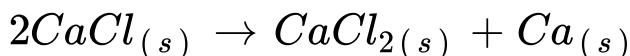


**Answer:**



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7. The enthalpy of formation of hypothetical  $CaCl_{(s)}$  theoretically found to be  $-188kJmol^{-1}$  and the  $\Delta_f H^\ominus$  for  $CaCl_{2(s)}$  is  $-795kJmol^{-1}$ . Calculate the  $\Delta_f H^\ominus$  for the disproportionation reaction.



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8. Compare and contrast the chemistry of group 1 metals with that of group 2 metals with respect to

- A. Nature of oxides
- B. Solubility and thermal stability of carbonates
- C. Polarising power of cations
- D. Reactivity and reducing power

**Answer:**

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9. What happens when:

- A. magnesium is burnt in air
- B. Quicklime is heated with silica
- C. Chlorine reacts with slaked lime
- D. Calcium nitrate is heated

**Answer:**



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10. Describe two important uses of each of the following

a. Caustic soda b. Sodium carbonate c. Quicklime



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**11.** List the raw materials required in the manufacture of portland cement. What is the role of gypsum in it?



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**12.** Name the chief forms of occurrence of magnesium in nature. How is magnesium extracted from one of its ores?



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**13.** Commercial aluminium always contains some magnesium, name two such alloys of aluminium.

What properties are imparted by the addition of magnesium to these alloys?



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**14.** Why is it that the  $s$  – block elements never occur free in nature? What are their usual modes of occurrence and how are they generally prepared?



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15. How will you distinguish between:

a. Magnesium and strontium b.  $K_2SO_4$  and  $BaSO_4$



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16. Give reasons for the following:

A.  $BeO$  is used as a refractory material.

B. Beryllium halides are polymeric.

C.  $Be(OH)_2$  dissolves in  $NaOH$ , but  $Ca(OH)_2$

does not



D. On hydrolysis at room temperature,  $Mg_3N_2$  gives ammonia, whereas  $MgCl_2$  gives  $HCl$ .

**Answer:**

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**17.** How is anhydrous magnesium chloride prepared from magnesium chloride hexahydrate?

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**18.** Give reasons for the following:

A. Why is calcium preferred over sodium to remove last traces of alcohol?

B. A piece of burning magnesium ribbon continues to burn in  $SO_2$ .

C. Halides of  $Be$  are soluble in organic solvents, while those of  $Ba$  are insoluble

D.  $BeCl_2$  fumes in moist air, but other alkline earth metal chloride do not.

**Answer:**



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19. Lattice enthalpies of  $BeF_2$ ,  $MgF_2$ ,  $CaF_2$  and  $BaF_2$  are  $-2906$ ,  $-2610$ ,  $-2459$  and  $-2367 kJ mol^{-1}$  respectively. Hydration enthalpies of  $Be^{2+}$ ,  $Ca^{2+}$ ,  $Ba^{2+}$  and  $F^{\ominus}$  are  $-2194$ ,  $-1921$ ,  $-1577$ ,  $-130$  and  $-457 kJ mol^{-1}$  respectively. Which of the fluorides has the highest solubility in water?



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20. On treatment with cold water, an element ( $A$ ) reacted quietly liberating a colourless, odourless gas ( $B$ ) and a basic solution ( $C$ ). Lithium reacted with

(B) yielding a solid product (D) which effervesced with water to give a strongly basic solution (E) and gas (F). When  $CO_2$  was bubbled through solution (C), initially a white ppt. (G) was formed, but this redissolved forming solution (H) when more  $CO_2$  was passed, precipitate (G) effervesced when moistened with conc  $HCl$  and gave a brick red colouration to the bunsen flame. When (G) was heated with carbon at  $1000^\circ C$ , a caustic white compound (I) was formed, which when heated with  $N_2O$  at  $1000^\circ C$  gave a solid (J) of some commercial importance. Identify (A) to (J) and explain the reactions.



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21. Give reasons for the following:

- a. Anhydrous calcium sulphate (anhydrite) cannot be used as plaster of Paris. B. Limewater turns milky on passing  $CO_2$  through it, but milkiness disappears on passing excess of  $CO_2$ . C. The reaction between marble and dil  $H_2SO_4$  is not used to prepare  $CO_2$ . d. In the manufacture of  $Mg$  by carbon reduction of  $MgO$ , the product is cooled in the stream of an inert gas. e. magnesium metal burns in air to give a white ash. when this ash is treated with water, the odour of ammonia can be detected.



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**22.** What happens when:

- a. Water is added to  $CaC_2$  and the resulting gas is passed through dil  $H_2SO_4$  containing  $HgSO_4$ . B. Hydrated  $MgCl_2$  is heated in presence of  $NH_4Cl$ . C.  $FeCl_3$  solution is treated with  $Mg$ . D.  $NH_4Cl$  is heated with  $Mg$ . e.  $CO_2$  is passed through limewater. f.  $SO_2$  is passed through limewater.



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**23.** Give the chemical formula of the following:

- a. Plaster of paris, b. Asbestos, c. Hydrolith, d. Lithopone, e. Gypsum, f. Marble, g. Anhydrite, h.

Baryta water, i. Quicklime, j. Slaked lime, k. Magnesite,  
l. Kieserite, m. Epsom salt, n. Baryta, o. Beryl, p.  
Witherite, q. Celsestine, r. Fluorspar



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## Ex 5 1 Objective

1. A metal  $M$  readily forms water soluble  $MSO_4$  water insoluble  $M(OH)_2$  and oxide  $MO$  which becomes inert on heating. The hydroxide is soluble in  $NaOH$ . Then  $M$  is:

A.  $Be$

B.  $Mg$

C.  $Ca$

D.  $Sr$

**Answer: A**



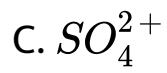
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2. A sodium salt on treatment with  $MgCl_2$  gives white precipitate on heating. The anion of the sodium salt is:

A.  $CO_3^{2-}$

B.  $HCO_3^\ominus$





**Answer: B**



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