CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

ALKALINE EARTH METALS

PROBLEMS

1. Why does the solubility of alkaline earth metal hydroxides in water increase down the group?

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

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3. It is very easy to obtain M^+ ion from an atom of alkaline earth metals. But M^+ ions are not formed. Why?

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4. Magnesium chloride is an ionic substance. It is also volatile. It does not impart flame colour. Why?

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5. Hydrides of alkaline earth metals do not posses same nature. Comment

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6. Among halides of alkaline earth metals fluorides are less soluble, but BeF_2 is more soluble. Why?

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7. Give some examples for metals other than beryllium and aluminium that becomes passive on. treatment with concentrated nitric acid.

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8. Lime water in aqueous solution gives white precipitate by passing carbondioxide, but the precipatate dissolves in excess carbondioxide. Why?

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9. What is the role of gypsum in cement ?

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10. Comment on the solubility of calcium sulphate in water.

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11. What are called earths ?

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12. Magnesium chloride is an ionic substance. It is also volatile. It does not impart flame colour. Why?

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13. It is very easy to obtain M^+ ion from an atom of alkaline earth metals. But M^+ ions are not formed. Why?

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14. Common salt is crystalline .But the salt prepared from sea water is wetted .Why ?

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15. Hydrides of alkaline earth metals do not posses same nature. Comment

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16. Among halides of alkaline earth metals fluorides are less soluble, but BeF_2 is more soluble. Why?

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17. What are methanides and acetylides ? Give examples

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18. $MgCl_2.6H_2O$ cannot be dehydrated on strong heating .Why?

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19. Magnesium on heating separately with aqueous ferric chloride and ammonium chloride gives the same gas, X,X is inflammable and reacts with metal to form electrovalent soild ,which on hydrolysis gives the same gas .Predict the gas X.

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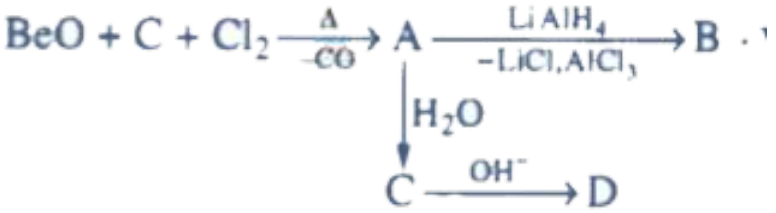

20. .What are A,B,C and D in these conversions ?

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21. Give some examples for metals other than beryllium and aluminium that becomes passive on. treatment with concentrated nitric acid.

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22. The crystal structure of epsom denotes many types of bonding .Substantiate.

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23. Dolamite is double salt. How is it commercially used for preparing magnesium sulphate ?

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24. Magnesia is a refractory material.Explain.

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25. Lime water in aqueous solution gives white precipitate by passing carbondioxide, but the precipatate dissolves in excess carbondioxide. Why?

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26. Magnesium content present in aqueous solution can be precipitated using either aqueous sodium carbonate or aqueous barium hydroxide .Write equation and discuss.

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27. What is the role of gypsum in cement ?

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28. Comment on the solubility of calcium sulphate in water.

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35. Give some examples for metals other than beryllium and aluminium that becomes passive on. treatment with concentrated nitric acid.

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36. Alkali metal carbonates are stable but carbonates of alkaline earth metals decompose on heating to liberate CO_2 Why?

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37. Comment on the structure of beryllium chloride

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38. Lime water in aqueous solution gives white precipitate by passing carbondioxide, but the precipatate dissolves in excess carbondioxide. Why?

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SUBJECTIVE EXERCISE - 1 (SHORT ANSWER QUESTIONS)

1. Beryllium deffers in properties from other elemets of its own group but shows resemblance wih aluminium because of

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2. In what respect the halides of Be differ from those of other elements of the group ?

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3. How are ionization potentials of alkaline earth metals varying from Be to Ba? Why do the 2^{nd} group elements have higher IE values than 1^{st} group elements ?

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4. Describe the method of preparing cement ?

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5. Imagine what would happen if gypsum is gradually heated to about $500^{\circ} C$.

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6. Write a note an the importance of Mg^{+2} in biology. What is the importance of Ca^{+2} in the functioning of the cell ?

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7. Why does the first elements in a group show anomalous behaviour. Give a reason.

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SUBJECTIVE EXERCISE - 1 (VERY SHORT ANSWER QUESTIONS)

1. What elements show diagonal relationship? Give an example

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2. Write the electronic configurations of Ca and Sr

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3. Write two important minerals of calcium. Give their composition

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4. Write different forms of calcium carbonate available.

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5. Write on the thermal stability of alkaline earth metal carbonates.

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6. What is plastar of paris? How is it prepared ?

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7. Write the setting of cement.

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8. Write uses of quick lime and slaked lime

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9. Write the uses of plaster of paris.

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OBJECTIVE EXERCISE - 1 (GENERAL)

1. The most abundant element among the following is

A. Mg

B. Ca

C. Sr

D. Ra

Answer: B

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2. Which of the following is thermally more stable

A. CaO_2

B. SrO_2

C. BaO_2

D. All are equally stable

Answer: C

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3. Which of the following is Radioactive element

A. Ra

B. Ba

C. Cs

D. Sr

Answer: A

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4. (A) : Among alkaline earths, Beryllium has only covalent halides.

(R): Be has least electronegativity.

A. Both A and R are correct and R is the correct explanation of A.

B. Both A and R are correct but R is not the correct explanation of A.

C. A is True but R is False.

D. R is False but A is True.

Answer: C

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5. Beryllium resembles the following element more than the members of its own family

A. Mg

B. Al

C. Li

D. Si

Answer: B

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6. From Be to Ba electropositive or metallic character

A. Increases

B. Decreases

C. Remains same

D. Cannot be predicted

Answer: A

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7. Which has a strong reducing character among the following

A. Be

B. Mg

C. Ca

D. Ba

Answer: D

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8. Among the following amphoteric oxide is

A. BeO

B. Al_2O_3

C. ZnO

D. All the above

Answer: D

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9. The correct order of polarising ability of cations of Alkaline earth metals is

A. $Be^{2+} > Ca^{2+} > Mg^{2+} > Ba^{2+}$

B. $Be^{2+} > Mg^{2+} > Ca^{2+} = Ba^{2+}$

C. $Be^{2+} < Mg^{2+} > Ca^{2+} < Ba^{2+}$

D. $Ba^{2+} < Ca^{2+} < Mg^{2} < Be^{2+}$

Answer: D

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10. Beryllium differs from other alkaline earth metals because of

A. Small size and Hifh EN

B. Large size and Low EN

C. Small size Low EN

D. Large size High EN

Answer: A

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11. Which of the following is a true peroxide

A. NO_2

B. MnO_2

C. RbO_2

D. BaO_2

Answer: D

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12. Which oxide is more basic among the following

A. BeO

B. MgO

C. CaO

D. BaO

Answer: D

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13. Which is more soluble among the following

A. BeO

B. MgO

C. CaO

D. BaO

Answer: D

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14. The most basic hydroxide among the following is

A. $Mg(OH)_2$

B. $Ca(OH)_2$

C. $Be(OH)_2$

D. $Ba(OH)_2$

Answer: D

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15. The covalent halide among the following is

A. BeF_2

B. $MgCl_2$

C. $CaCl_2$

D. $BaCl_2$

Answer: A

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16. Tonic nature of group 2 hydrides is

A. $BeH_2 > MgH_2 > CaH_2 > SrH_2 > BaH_2$

B. $BeH_2 < MgH_2 < CaH_2 < SrH_2 < BaH_2$

C. $BeH_2 > MgH_2 < CaH_2 < SrH_2 < BaH_2$

D. None

Answer: B

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17. The halide that is highly soluble in H_2O among the following is

A. BeF_2

B. CaF_2

C. MgF_2

D. BaF_2

Answer: A

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18. $MgCl_2.XH_2O, CaCl_2.YH_2O$ and $BaCl_2.ZH_2O$. The values of X, Y and Z are respectively

A. 2, 6, 8

B. 8, 6, 2

C. 2, 4, 8

D. 4, 6, 8

Answer: B

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19. Which of the following is more soluble in ether?

A. $BeCl_2$

B. $CaCl_2$

C. $SrCl_2$

D. $BaCl_2$

Answer: A

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20. (A): Oxides of II A group elements are stable

(R) : Oxides of IIA group elements have high lattice energy.

A. Both A and R are correct and R is the correct explanation of A.

B. Both A and R are correct but R is not the correct explanation of A.

C. A is True but R is False.

D. R is False but A is True.

Answer: A

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21. Which of the following salts does not impart a colour to the flame ?

A. $LiCl$

B. KCl

C. $MgCl_2$

D. $CaCl_2$

Answer: C

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22. Which element of group 2 is used in treatment of cancer ?

A. Magnesium

B. Radium

C. Strontium

D. Beryllium

Answer: B

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23. Which of the following belongs to the homologous series of $C_5H_8O_2N$?

A. $C_6H_{10}O_3N$

B. $C_6H_8O_2N_2$

C. $C_6H_{10}O_2N_2$

D. $C_6H_{10}O_2N$

Answer: D

24. Beryllium deffers in properties from other elemets of its own group but shows resemblance wih aluminium because of

A. relatively bigger ionic radius and high polarising power of Be

B. relatively smaller ionic radius and high polarising power of Be

C. relatively bigger ionic radius and only reason behind this

D. None of the above

Answer: B

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OBJECTIVE EXERCISE - 1 (Magnesium and calcium)

1. Enzyme contains which of the following ion

A. Ca^{+2}

B. Mg^{+2}

C. K^{+}

D. Na^+

Answer: B

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2. Which of the following is correct

A) Ca^{2+} ions are necessary to blood clotting

B) Ca^{2+} ions to maintain regular heart beating

C) Ca^{2+} for muscle contraction

A. A, B

B. A, C

C. B, C

D. A, B, C

Answer: D

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3. The wire in the flash bulbs is made up of

A. Mg

B. Ba

C. Cu

D. Ag

Answer: A

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4. (A) : Salts of Mg does not impart any colour to the flame

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

A. Both A and R are correct and R is the correct explanation of A.

B. Both A and R are correct but R is not the correct explanation of A.

C. A is True but R is False.

D. R is False but A is True.

Answer: A

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5. The least soluble carbonate among the following is

A. Na_2CO_3

B. K_2CO_3

C. $CaCO_3$

D. Rb_2CO_3

Answer: C

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6. The carbonate which decomposes on heating is

A. Na_2CO_3

B. K_2CO_3

C. $MgCO_3$

D. Cs_2CO_3

Answer: C

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7. The metal that is used as a deoxidiser in metallurgy is.

A. Sn

B. Pb

C. Cu

D. Mg

Answer: D

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8. Chlorophyll contains

A. Ca^{2+}

B. Mg^{2+}

C. Fe^{2+}

D. Fe^{3+}

Answer: B

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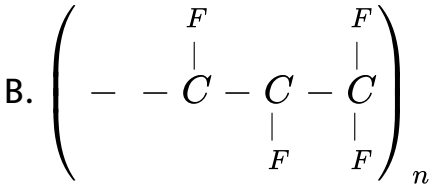
9. The compound formed when enamel on the surface of the teeth reacts with Fions

A. CaF_2

B. 

C. $3Ca_3(PO_4)_2.Ca(OH)_2$

D. $3Ca(PO_4)_2.CaF_2$

Answer: D

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10. Cement is a mixture of

A. Lime, sand and alumina

B. Limestone, sand and water

C. Dolomite, sand and water

D. Magnesite, slaked lime and water

Answer: A

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11. The final product of setting of plaster of paris is as

A. Gypsum

B. anhydride

C. Cement

D. Mortar

Answer: A

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12. What is the molecular formula of gypsum?

A. $CaSO_4..H_2O$

B. $CaSO_4.2H_2O$

C. $2CaSO_4.H_2O$

D. $CaSO_4.3H_2O$

Answer: B

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13. What is the molecular formula of plaster of paris?

A. $2CaSO_4.H_2O$

B. $2CaSO_4.2H_2O$

C. $CaSO_4.2H_2O$

D. $CaSO_4.3H_2O$

Answer: A

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14. (A): $CaSO_4$ is called dead burnt gypsum because it does not set with water

(R) : Mixture of 1 part of slaked lime, 3 parts of sand and water is known as mortar

A. Both A and R are correct and R is the correct explanation of A.

B. Both A and R are correct but R is not the correct explanation of A.

C. A is True but R is False.

D. R is False but A is True.

Answer: A

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15. Portland cement clinker has highest weight percentage of

A. dicalcium silicate

B. tricalcium silicate

C. dicalcium aluminate

D. tricalcium aluminate

Answer: B

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16. Weight percentage of gypsum in cement is approximately

A. 2

B. 5

C. 9

D. 15

Answer: A

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17. Plaster of paris hardens by

A. Giving off CO_2

B. Changing into $CaCO_3$

C. Combining with water

D. Giving out water

Answer: C

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18. How is plaster of paris prepared ? What is setting of plaster of paris ?

A. oxidation with atmospheric O_2

B. combining with atomospheric CO_2

C. hydration

D. dehydration

Answer: C

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19. Quicklime is represented by the formula

A. $Ca(OH)_2$

B. CaO

C. $CaCO_3$

D. $CaHCO_3$

Answer: B

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20. Which of the following statements is false ?

A. Ca^{2+} ions are not important in maintaining the regular beatin of the heart

B. Mg^{2+} ions are important in the green parts of plants

C. Mg^{2+} ions form a complex with ATP

D. Ca^{2+} ions are important in blood clotting,

Answer: A

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OBJECTIVE EXERCISE - 2 (General)

1. CaC_2 react with H_2O to form which gas

A. CH_4

B. C_2H_4

C. C_2H_3

D. All

Answer: C

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2. $CaCO_3 \xrightarrow[1073]{\Delta} CaO + CO_2$

(Reverse reaction takes place). To prevent backward reaction

A. CO_2 is removed from reaction mixure

B. CO_2 is added to the reaction mixture

C. CaO is removed from reaction mixture

D. $CaCO_3$ is added to reaction mixture

Answer: A

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3. Covalent polymeric chloride among the following is

A. CaH_2

B. SrH_2

C. BeH_2

D. BaH_2

Answer: C

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4. Which of the following is the correct order of solubility in water ?

A. $BaSO_4 > SrSO_4 > CaSO_4 > MgSO_4$

B. $BaSO_4 > MgSO_4 > SrSO_4 > CaSO_4$

C. $MgSO_4 > CaSO_4 > SrSO_4 > BaSO_4$

D. $MgSO_4 > BaSO_4 > CaSO_4 > SrSO_4$

Answer: C

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5. Pick out the wrong statement

A. Be like Al does not dissolve in alkalies

B. Oxides of both Be and Al are amphoteric

C. Beryllium chloride like Aluminium chloride is covalent

D. Carbides of both Be and Al react with water evolving methane

Answer: A

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6. BeF_2 is highly soluble in water, whereas the fluorides of other alkaline earth metals are almost insoluble because

A. BeF_2 is ionic in nature

B. BeF_2 is covalent in nature

C. Hydration energy of BeF_2 is much higher than lattice energy

D. Lattice energy of BeF_2 is much higher than its hydration energy

Answer: C

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7. Among the following the standard oxidation potential is highest for

A. Be

B. Mg

C. Ca

D. Ba

Answer: D

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8. The metal which imparts Brick red colour to flame is

A. Be

B. Mg

C. Ca

D. Ba

Answer: C

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9. Alkaline earth metals exhibit $+2$ oxidation state in aqueous solution due to

A. small size of metal atoms

B. their hydration energies being higher than second ionisation potential

C. their hydration energy being less than second ionisation potential

D. their low second ionisation potential

Answer: B

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OBJECTIVE EXERCISE - 2 (Calcium and magnesium)

1. Oxidation state of boron in Magnesium boride

A. -3

B. $+3$

C. $+1$

D. -1

Answer: A

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2. $BeCl_2 \xrightarrow{\text{'x'}} BeH_2$, Here 'X' is

A. $NaOH$

B. H_2

C. $LiAlH_4$

D. All

Answer: C

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3. Which of the following is a constituent of chewing gum ?

A. $CaCO_3$

B. Na_2CO_3

C. $CaSO_4$

D. $Ca(OH)_2$

Answer: A

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4. Which physical property is lower for alkaline earth metals as compared to alkali metals of the same period ?

A. Hardness

B. Melting point

C. Electropositivity

D. Ionisation potential

Answer: C

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5. Which is soluble in water

A. $BeSO_4$

B. $CaSO_4$

C. $SrSO_4$

D. $BaSO_4$

Answer: A

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6. Two metals (A) and (B) belongs to the same group of periodic table. Metal (A) forms an insoluble oxide but soluble

sulphate. Metal (B) forms soluble oxide and insoluble sulphate. Then A and B are respectively

A. Ba, Be

B. Ca, Ba

C. Be, Ca

D. Be, Na'

Answer: B

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7. Chemical A is used for water softening to remove temporary hardness. A reacts with sodium carbonate to generate caustic soda. When carbondioxide is bubbled

through A, it turns cloudy. What is the chemical formula of A?

A. $CaCO_3$

B. CaO

C. $Ca(OH)_2$

D. $Ca(HCO_3)_2$

Answer: C

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8. Mg is an important component of which bio molecule occuring extensively in living world?

A. Haemoglobin

B. Chlorophyll

C. Florigen

D. ATP

Answer: B

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9. The carbonate having high decomposition temperature among the following is

A. $MgCO_3$

B. $BeCO_3$

C. $CaCO_3$

D. $BaCO_3$

Answer: D

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10. The most soluble hydroxide among the following is

A. $Be(OH)_2$

B. $Ca(OH)_2$

C. $Mg(OH)_2$

D. $Ba(OH)_2$

Answer: D

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OBJECTIVE EXERCISE - 2 (Gypsym and cement)

1. Dead burnt gypsum on warming with water gives

A. Gypsum

B. Plaster of Paris

C. Cement clinker

D. Remains as it is

Answer: D

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2. Calcium sulphate is available naturally as

A. Gypsum

B. Anhydrite

C. Alabaster

D. All the above

Answer: D

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3. The correct statement among the following

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

B. Gypsum is obtained by heating plaster of Paris

C. Plaster of Paris can be obtained by hydration of gypsum

D. Plaster of Paris is obtained by partial oxidation of gypsum

Answer: A

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4. When CO_2 is passed into $Ca(OH)_2$ a white precipitate is formed due to the formation of

A. $CaCO_3$

B. $Ca(HCO_3)_2$

C. CaC_2

D. None

Answer: A

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

A. The hydration energy of Na_2SO_4 is more than its lattice energy

B. The lattice energy of $BaSO_4$ is less than its hydration energy

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

D. The lattice energy of Na_2SO_4 is more than its hydration energy

Answer: A

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6. A major constituent of portland cement is?

A. Silica

B. Alumina

C. Iron oxide

D. Magnesia

Answer: A

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PRACTICE EXERCISE

1. Among the following which does not react even with hot water ?

A. Be

B. Na

C. Mg

D. Ba

Answer: A

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2. The maximum covalency of Be and Mg respectively

A. 4, 6

B. 2, 4

C. 4, 8

D. 2, 6

Answer: A

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3. The pair of elements do not impart flame colour test

A. $Be\&Ca$

B. $Ca\&Mg$

C. $Mg\&Ba$

D. $Be\&Mg$

Answer: D

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4. Thermally most stable oxide is

A. Na_2O

B. MgO

C. Rb_2O

D. K_2O

Answer: B

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5. Amphoteric hydroxide among the following

A. $Mg(OH)_2$

B. $Be(OH)_2$

C. $Ca(OH)_2$

D. $Ba(OH)_2$

Answer: B

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6. Which of the following is least soluble in water

A. CaF_2

B. $CaCl_2$

C. $CaBr_2$

D. CaI_2

Answer: A

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7. The difference of water molecules in one molecule of each gypsum and plaster of paris is

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

B. 2

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

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

Answer: C

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8. In the hardening stage of plaster of paris, the compound formed is

A. $CaSO_4$

B. Orthorhombic $CaSO_4.2H_2O$

C. $CaSO_4.\ H_2O$

D. Monoclinic $CaSO_4.2H_2O$

Answer: D

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9. Dead burnt is obtained from gypsum, on heating at

A. $35^\circ C$

B. $100^\circ C$

C. $120^\circ C$

D. $180^\circ C$

Answer: D

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10. Metals that are passive by conc HNO_3 are cr,zn,Al

A. only 1

B. 1 and 2

C. I and 3

D. all

Answer: D

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11. Which of the following statements are correct

i) Both carbides of Be and Al react with water to produce methane gas

ii) Be and Al dissolves in alkali to from berrylates and aluminates

iii) Be forms many complexes when compared with remaining II_A- group elements.

A. I, ii are correct

B. ii, iii, are correct

C. I, iii are correct

D. I, ii, iii are correct

Answer: D

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12. Ions necessary for blood clotting and for muscle contraction

A. Fe^{3+}

B. Fe^{2+}

C. K^{+}

D. Ca^{2+}

Answer: D

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13. One of the important uses of quicklime is ?

A. As a purgative

B. Drying gases and alcohols

C. Bleaching silk

D. Dyeing cotton

Answer: B

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14. In India on the occasion of marriage the fireworks are used to give coloured flames. The salt of which one of the following metals is used to obtain green flame for this purpose ?

A. Na

B. Ba

C. K

D. Ca

Answer: B

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15. The following monoxide is a high melting solid

A. Na_2O

B. K_2O

C. MgO

D. K_2O_2

Answer: C

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16. The following are the statements about oxides of IIA elements

i) Oxides of IIA elements are basic and thermally stable

ii) BeO and $Be(OH)_2$ are basic in nature

iii) Solubility and basic nature of oxides of IIA elements increase from BeO to BaO The correct combination is

A. ii and iii are correct

B. I and ii are correct

C. I and iii are correct

D. all are the correct

Answer: C

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17. Beryllium hydroxide dissolves in excess of alkli to give

A. $\left[Be(OH)_2\right]^-$

B. $\left[Be(OH)_2\right]^{-2}$

C. $\left[Be(OH)_4\right]^{-2}$

D. $\left[Be(OH)_4\right]^{3-}$

Answer: C

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18. Correct statements regarding diagnal relationship between belyllium and aluminium are A) Both $BeCl_2$ and $AlCl_3$ are strong Lewis acids

B) Both $Be(OH)_2$ and $Al(OH)_3$ are dissolve in excess alkali to give beryllate ion and aluminate ion respectively

C) Charge/radius ratio of Bc^{2+} and A^{2+} ions is similar

D) Both $BeCl_2$ and $AlCl_3$ are insoluble in organic solvents

A. A, B, D

B. A, B, C

C. B, C, D

D. A, C, D

Answer: B

Watch Video Solution

19. The decomposition temperature of $BaCO_3(A), MgCO_3(B)$ and $CaCO_3(C)$ follow the order

A. $Z > X > Y$

B. $X > Y > Z$

C. $Y > Z > X$

D. $X > Z > Y$

Answer: A

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Watch Video Solution

20. Weight percentage of silica in portland cement is

A. 12

B. 22

C. 32

D. 42

Answer: B

Watch Video Solution

21. During the conversion of one mole of gypsum to one mole of plaster of paris the percentage loss in weight is

A. 15.7

B. 27

C. 20

D. 7.85

Answer: A

Watch Video Solution

22. Match the following

LIST - I	LIST - II
A) Aqueous solution	1) $CaSO_4.2H_2O$ of $Ca(OH)_2$
B) Suspension of	2) $2CaSO_4.H_2O$ slaked line in water
C) Plaster of paris	3) Milk of lime
D) Gypsum	4) Lime water

A. $\begin{matrix} A & B & C & D \\ 3 & 4 & 1 & 2 \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ 4 & 3 & 1 & 2 \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ 4 & 3 & 2 & 1 \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ 3 & 4 & 2 & 1 \end{matrix}$

Answer: C

Watch Video Solution

23. The basic character of oxides $MgO, SrO, K_2O, NiO, Cs_2O$ increase in the order

A. $MgO > SrO > K_2O > NiO > Cs_2O$

B. $Cs_2O < K_2O < MgO < SrO < NiO$

C. $NiO < MgO < SrO < K_2O < Cs_2O$

D. $K_2O < NiO < MgO < SrO < Cs_2O$

Answer: C

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24. A burning strip of magnesium is introduced into a jar containing a gas. After sometime the walls of the container is coated with carbon. The gas in the container is

A. O_2

B. N_2

C. CO_2

D. H_2O

Answer: C

Watch Video Solution

25. The calcium concentration in plasma is regulated by which harmones

A. Insuline, Glucagon

B. Thyroxine, Testosteron

C. Esradiol Progesterone

D. Calcitonin, Parathyroid

Answer: D

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26. Correct matching about composition of portland cement is

List - I	List - II
I) Al_2O_3	A) $50-60\,\%$
II) CaO	B) $20-25\,\%$
III) SiO_2	C) $5-10\,\%$
IV) MgO	D) $2-3\,\%$

A. $\begin{matrix} I & II & III & IV \\ C & A & B & D \end{matrix}$

B. $\begin{matrix} I & II & III & IV \\ A & B & C & D \end{matrix}$

C. $\begin{matrix} I & II & III & IV \\ A & C & B & D \end{matrix}$

D. $\begin{matrix} I & II & III & IV \\ C & A & D & B \end{matrix}$

Answer: A

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27. Bleaching powder is obtained by the reaction chlorine with

A. Quick lime

B. Lime stone

C. Gypsum

D. Slaked lime

Answer: D

Watch Video Solution

28. $Be(OH)_2 + 2HCl + 2H_2O \rightarrow X$

In the complex "X", oxidation state and coordination number of Be are respectively

A. $+2$ and 4

B. $+2$ and 6

C. $+4$ and 4

D. $+4$ and 6

Answer: A

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29. Which of the following is unstable and can be kept only in the atmosphere of CO_2 ?

A. $MgCO_3$

B. $BaCO_3$

C. $BeCO_3$

D. $CaCO_3$

Answer: C

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30. Wrong statement of the following is

A. Beryllium chloride has a chain structure in the solid state

B. Beryllium chloride tends to form chloro bridged dimer in the vapour phase

C. Beryllium hydroxide reacts with both acid and alkali

D. BeO is essentially ionic in nature

Answer: D

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31. A suspension of mangnesium hydroxide in water is called ---- and is used as ----- in medicine

A. Milk of lime, Anticeptic

B. Milk of magnesia, Antacid

C. Beryllate, Antipysetic

D. Magnalium, Analgesic

Answer: B

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32. Alkaline earth metal having least melting point is

A. Be

B. Mg

C. Ca

D. Ba

Answer: B

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33. Correct order of hydration enthalpies

A. $Li^+ > Na^+ > Be^{2+} > Mg^{2+}$

B. $Mg^{2+} > Be^{2+} + Na^+ > Li^{2+}$

C. $Be^{2+} > Mg^{2+} > Li^+ > Na^+$

D. $Na^+ > Li^+ > Mg^+ > Be^{2+}$

Answer: C

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34. Which of the following is NOT correct ?

A. $LiOH$ is a weaker base than $NaOH$

B. Salts of Be undergo hydrolysis

C. $Ca(HCO_3)_2$ is soluble in water

D. Hydrolysis of beryllium carbide gives acetylene

Answer: D

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35. $CaCO_3.MgCO_3 \xrightarrow{\Delta} X + Y + Z$

A. $CaCO_3, MgO$ and CO_2

B. $CaO, MgCO_3$ and CO_2

C. CaO, MgO and CO_2

D. Ca, Mg and CO_2

Answer: B

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Lecture sheet (Level-I (Main))

1. The density of Mg is more than that of "Ca" because

A. Nuclearcharge of 'Ca' is more than Mg

B. vacant 3d orbital is present in Ca

C. Vacant 3d orbital is present in Mg

D. None of the above

Answer: B

Watch Video Solution

2. The set representing the correct increasing order of first ionization enthalpy

A. $Na < K < Li$

B. $Ca < Mg < Be$

C. $Si < Ge < C$

D. $C < B < N$

Answer: B

Watch Video Solution

3. During millotary operation hydrogen is generally obtained by the action of H_2O on

A. BeH_2

B. CaH_2

C. $NaBH_4$

D. LiA/H_4

Answer: B

Watch Video Solution

Watch Video Solution

4. Which of the following calcium halide has more melting point.

A. CaF_2

B. $CaCl_2$

C. $CaBr_2$

D. CaF_2

Answer: A

Watch Video Solution

5. Which of the following is used to remove lignin from woodpulp?

A. Slakedlime

B. Calcium bisulphate

C. Unslaked lime

D. Calcium acetate

Answer: B

Watch Video Solution

6. Which of the following carbonate is more thermally stable

A. $BeCO_3$

B. $MgCO_3$

C. $CaCO_3$

D. $BaCO_3$

Answer: D

Watch Video Solution

7. Which of the following metal sulphate is more soluble in water

A. $BasO_4$

B. $BeSO_4$

C. $CaSO_4$

D. $SrSO_4$

Answer: B

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8. Be' has, as compared to "Mg"

A. Less electronegativity

B. More ionisation potential

C. larger atomic radius

D. Lower melting point

Answer: B

Watch Video Solution

9. Which of the following is amphoteric

A. Li_2O

B. BeO

C. Bao

D. Cs_2O

Answer: B

Watch Video Solution

10. Which of the S-block element doesn't react with water.

A. K

B. Na

C. Be

D. Ca

Answer: C

Watch Video Solution

Lecture sheet (Level-II (Advanced))

1. What products are obtained when magnesite dissolved is desolved in hot dilute H_2SO_4

A. $MgSO_4, H_2O, CO_2$

B. Mgs, H_2O, CO_2

C. $MgSO_4, H_2CO_3$

D. Mgs, H_2CO_3

Answer: A

Watch Video Solution

2. Bleaching powder turns red litmus to litmus to blue and finally white, it is due to

A. OH^-

B. HCl

C. OCl^-

D. Cl^-

Answer: C

Watch Video Solution

Watch Video Solution

3. Which of the following are correctly matched

A. $Be(OH)_2 < Mg(OH)_2 > Ca(OH)_2 > Ba(OH)_2$

[Basic strength]

B. $Be(OH)^2 > Mg(OH)^2 > Ca(OH)^2 < Sr(OH)_2$

(Thermal stability)

C. $BeO > MgO > CaO > SrO$ (Basic strength)

D. $BeSO_4 < SrSO_4 < BaSO_4 < CaSO_4$ (solubility in H_2O)

Answer: A

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4. Which of the following is nature ore name of calcium

A. Hydrolith

B. Colemanite

C. Artinite

D. Phosphorate

Answer: C

Watch Video Solution

5. Which of the following is the ore name related to 'Mg'

A. Brucite

B. Anhydrite

C. Baryta

D. None of these

Answer: A

Watch Video Solution

6. Which of the following is correctly matched

A. $\begin{matrix}\text{Element} & & \text{Calcium in flame test}\\ Ca & \longleftrightarrow & \text{Apple green}\end{matrix}$

B. $\begin{matrix}\text{Element} & & \text{Calcium in flame test}\\ Mg & \longleftrightarrow & \text{Reddish colour}\end{matrix}$

C. $\begin{matrix}\text{Element} & & \text{Calcium in flame test}\\ Na & \longleftrightarrow & \text{Golden yellow spangles}\end{matrix}$

D. $\begin{matrix}\text{Element} & & \text{Calcium in flame test}\\ Mn & \longleftrightarrow & \text{Violet colour}\end{matrix}$

Answer: C

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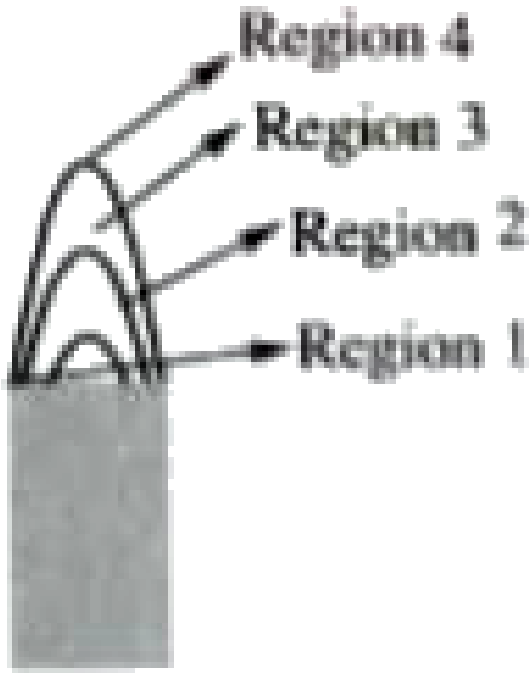
7. The hottest region of Bunsen flame showin in the figure below



A. Region2

B. Region3

C. Region4

D. Region1

Answer: A

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8. Which salt hydrolyses to a minimum extent

A. $Mg(NO_3)_2$

B. $Be(NO_3)_2$

C. $Ca(NO_3)_2$

D. $Ba(NO_3)_2$

Answer: D

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9. A doctor by mistake administres a dilute $Ba(NO_3)$ solution to a patient for radiographic investigations. Which of the following should be the best to prevent the absorption of soluble barium and subsequent barium poisoning

A. $NaCl$

B. Na_2SO_4

C. Na_2CO_3

D. NH_4Cl

Answer: B

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10. Consider the following statements

(A) Gypsum contains a low percentage of calcium than plaster of paris

(B) Plaster of paris can be reobtained by hydration of dead plaster

(C) Gypsum looses $3/2$ of its water of crystallisation formes plaster of paris at $120^\circ C$

(D) Plaster of paris can be obtained by partial oxidation of gypsum

Arrange them in the order of true/false

A. TFTF

B. "FF"TF

C. "TT""FF"

D. "TTTT"

Answer: A

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11. Which of the following are correct

A. $Be > Ca > Sr > Ba > Mg$ (melting point)

B. $Be > Mg > Ca > Sr > Ba$ (second ionisation potential)

C. $Be > Mg > Ca > Sr > Ba$ (hydration energy)

D. $Be > Mg > Ca > Sr > Ba$ (Density)

Answer: A::B::C

Watch Video Solution

12. Which following are in correct

A. $BeCO_3 > mgCO_3 > CaCO_3 > SrCO_3 > BaCO_3$

(solubility)

B. $BeF_2 > MgF_2 > CaF_2 < SrF_2 < BaF_2$ (solubility)

C. $Beo > MgO > CaO > SrO > BaO$ (radius ratio)

D. $Ba > Sr > Ca > Mg > Be$ (hydration enthalpy)

Answer: C::D

Watch Video Solution

13. Which of the following are correct

A. $3Ba(NH_2)_2 \rightarrow Ba_3N_2 + 4NH_3$

B. $Be + 2OH^- \rightarrow BeO_2^- + H_2 \uparrow$

C. $Mg(HCO_3)_2 + MgO \rightarrow 2MgCO_3 + H_2O$

D. $BeO \oplus 3NaOH \rightarrow Na_3BeO_3 + H_2$

Answer: A::C

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14. Which of the following statements are false regarding $BeCl_2$

A. In solid state, $BeCl_2$ exits in the form of linear structure

B. In vapour state it exits as a trimer with bridged structure

C. Below $1200K$ it has cyclic structure

D. Invapour state is exits as a solid with bridged structure

Answer: A::B::C

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15. During setting of plaster of paris which of the following process takes place

A. Hydration

B. Hydrolysis

C. Crystallisation

D. Evoluation of heat

Answer: A::C::D

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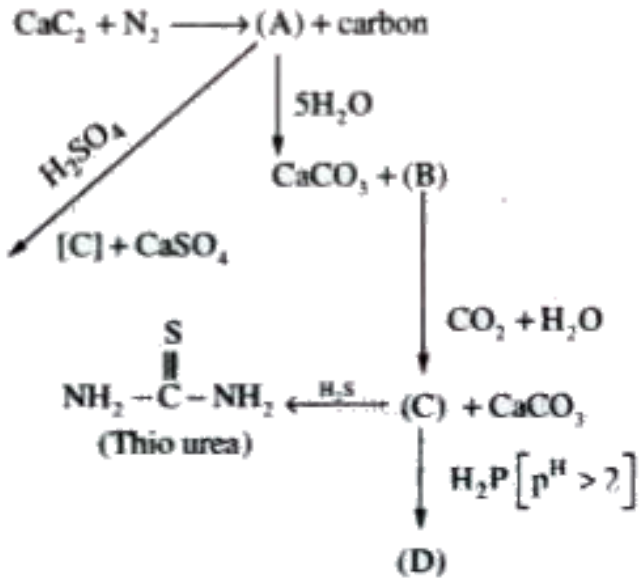
16.



'A' is widely used as slow acting nitrogeneous fertilizer.

A. $CaNCN$

B. Ca_3N_2

C. $CaCO_3$

D. $Ca(CN)_2$

Answer: A

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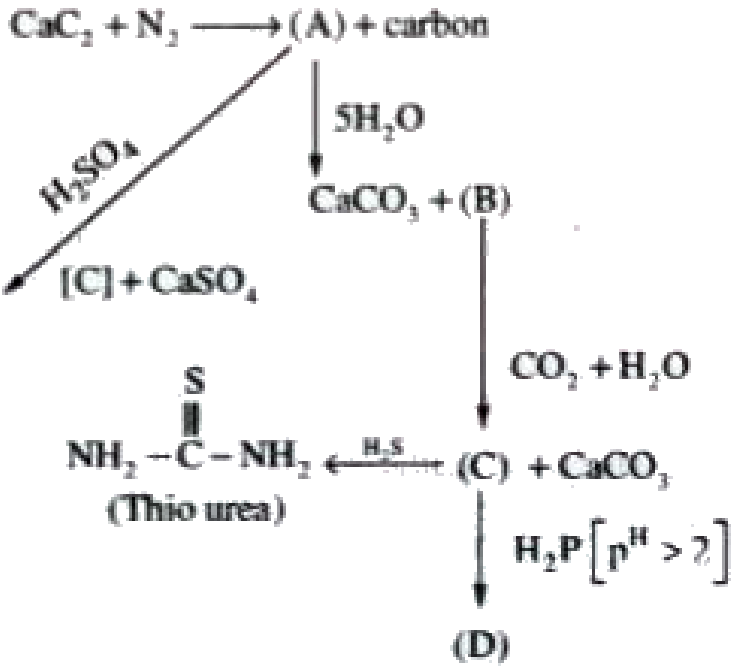

17.

'B' is a weak basic aqueous NH_3 solution

A. NH_4OH

B. NH_4Cl

C. NH_4NO_2

D. $(NH_4)_3PO_4$

Answer: A

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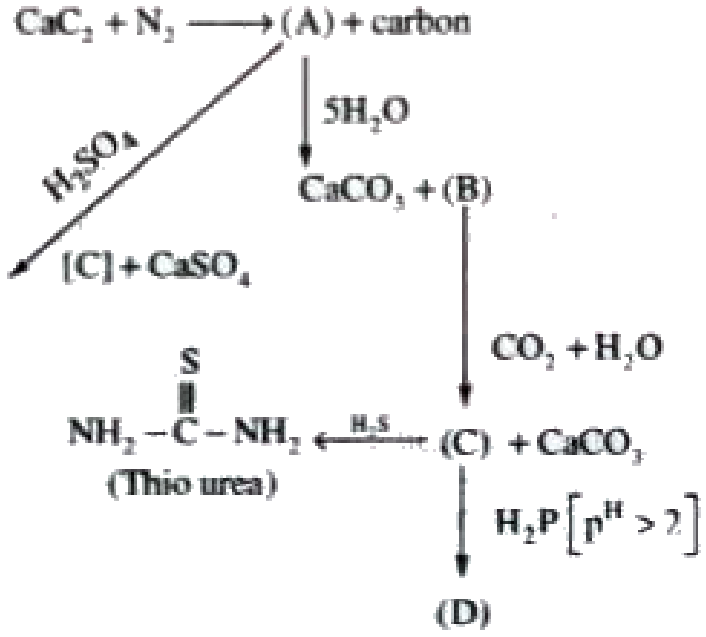

18.

The compound 'C' is used to make urea and Thio urea.

A. NH_2CN

B. NH_4CN

C. $(NH_4)_3PO_4$

D. NH_4OH

Answer: A

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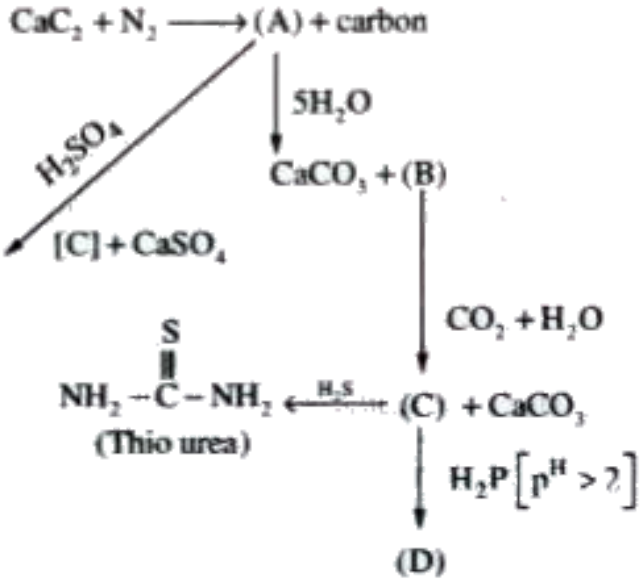

19.

The compound 'D' is used as nitrogeneous fertilizer.

A. Urea

B. Slakedlime

C. NH_4OH

D. None of these

Answer: A

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20. The compound 'A' on heating gives a colourless gas and a residue. The residue dissolves in water to obtain (B). When excess of CO_2 is bubbled through aqueous solution of B gentle heating gives back A.

Compound 'C' is

A. $CaCO_3$

B. $Ca(HCO_3)_2$

C. Na_2CO_3

D. K_2CO_3

Answer: A

Watch Video Solution

21. The compound 'A' on heating gives a colourless gas and a residue. The residue dissolves in water to obtain (B). When excess of CO_2 is bubbled through aqueous solution of B gentle heating gives back A.

Compound 'C' is

A. Slaked lime

B. Quick lime

C. Mortar

D. Clinker

Answer: A

Watch Video Solution

22. The compound 'A' on heating gives a colourless gas and a residue. The residue dissolves in water to obtain (B). When excess of CO_2 is bubbled through aqueous solution of B gentle heating gives back A.

Compound 'C' is

A. $NaHCO_3$

B. $Ca(HCO_3)_2$

C. $Ca(OH)_2$

D. CaO

Answer: B

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23. Match the following columns

Matrix Matching Type Questions

Column-I	Column-II
A) Beo	P) Amphoteric
B) Al_2O_3	Q) Diagonal relation ship
C) mgO	R) Lime water
D) CaO	S) Baryta water
E) BaO	T) Water insoluble
	U) Maximum soluble in H_2O
	V) Estimated by EDTA

Watch Video Solution

24. Match the following columns

Column-I	Column-II
A) Beo (S)	P) Amphoteric in nature
B) $NaHCO_3$ (crystalline)	Q) Imparts characteristic colour to Bunsen flame
C) $BeCl_2$(S)	R) Produce H_2O_2 and O_2 on reaction with water
D) CsO_2 (S)	S) Show hydrogen bonding
	T) Has a chain structure

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25. The value of 'n' in the molecular formula $Be_nAl_2Si_6O_{18}$ is

Watch Video Solution

26. When gypsum is heated at 393K, the compound formed is $CaSO_4.XH_2O$ value of 6X is

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27. How many of the following will turn moist red litmus blue and finally white ?

$Li_2O, KO_3, RbO_2, Cs_2O_2, BeO, MgO, BaO_2, SrO$

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Practice sheet (Level-I(Main))

1. Which of the following is the strongest base

A. $Ca(OH)_2$

B. $Mg(OH)_2$

C. $Sr(OH)_2$

D. $Ba(OH)_2$

Answer: D

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2. Which of the following cannot decompose on heating to give CO_2 in a dry test tube ?

A. Li_2CO_3

B. Na_2CO_3

C. $KHCO_3$

D. $BeCO_3$

Answer: B

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3. $CaCO_3 + HNO_3 \rightarrow$ products

A. $Ca(NO_3)_2, H_2O, CO_2$

B. $Ca(NO_3)_2, H_2CO_3$

C. Ca_3N_2, CO_2, H_2O

D. None of these

Answer: A

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4. What product will be obtained when magnesite is dissolved in hot dilute H_2SO_4

A. $MgSO_4, H_2O, CO_2$

B. MgS, H_2O, CO_2

C. $MgSO_4, H_2CO_3$

D. MgS, H_2CO_3

Answer: A

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5. Aqueous solution of $CaCl_2$ is

A. Acidic

B. Basic

C. Neutral

D. None of these

Answer: B

Watch Video Solution

6. $Be_2C + H_2O \rightarrow Be(OH)_2 + [X]X$ is

A. C_2H_2

B. $CH_3 - C \equiv C - H$

C. C_2H_6

D. CH_4

Answer: D

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7. The pair of amphoteric hydroxides is

A. $Be(OH)_2$,$Al(OH)_3$

B. $Al(OH)_3$, $LiOH$

C. $B(OH)_3, Be(OH)_3, Be(OH)_2$

D. $Be(OH)_2, Mg(OH)_2$

Answer: A

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8. Drying agent which react with CO_2 and removes water vapours from ammonia is

A. CaO

B. $CaCl_2$

C. $CaCO_3$

D. $Ca(NO_3)_2$

Answer: A

Watch Video Solution

9. The substance not likely to contain $CaCO_3$ is

A. Calcined gypsum

B. Sea shells

C. Dolomite

D. Marble stone

Answer: A

Watch Video Solution

10. Which one of the following will not give flame test?

A. Be

B. Mg

C. Both (1) and (2)

D. Ca

Answer: C

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Practice sheet (Level-II(Advanced))

1. Be and Al exhibit many properties which are similar, but the two elements differ in

A. Exhibiting maxium covalency in compounds

B. Exhibiting amphoteric nature in their oxides

C. Forming covalent halides

D. Forming polymeric hydrides

Answer: A

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2. Be and Al exhibit diagonal relationship. Which of the following statements about then is//are not true ?

(i) Both react with HCl to liberate H_2

(ii) They are made passive by HNO_3

(iii) Their carbides gives acetylene on treatment with water

(iv) Their oxides are amphoteric

A. (iii) and (iv)

B. (i) and (iii)

C. (i) only

D. (iii) only

Answer: D

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3. Complete the following equations and identify the products A,B and C.

$$BeCl_2 + N_2O_4 \xrightarrow{\text{ethylacetate}} A \xrightarrow{50^\circ C, \text{Vacuum}} B \xrightarrow{120^\circ C} C$$

A. $BeCl_2.\ N_2O,\ Be(NO_3)_2,\ Be(NO_3)_2,\ Be(NO_2)_2$

B. $Be(NO_3)_2,\ Be(NO_2)_2,\ BeO$

C. $Be(NO_3)_2.2NO_2O_4$, $Be(NO_3)_2$, $Be_4O(NO_3)_6$

D. BeO, $Be(NO_2)_2$, $Be(NO_3)_2$

Answer: C

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4. The decomposition temperature is lowest for

A. $BeCO_3$

B. $MgCO_3$

C. $SrCO_3$

D. $BaCO_3$

Answer: A

Watch Video Solution

5. A burning magnesium ribbon will continue to burn in

A. CO_2 and SO_2

B. N_2, CO_2 and SO_2

C. N_2 and steam

D. N_2, CO_2, SO_2 and steam

Answer: D

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6. Which of the following represents the composition of carnallite mineral ?

A. $K_2O.\ Al_2O_3.6SiO_2$

B. KNO_3

C. $K_2SO_4.\ MgSO_4.\ MgCl_2.6H_2O$

D. $KCl.\ MgCl_26H_2O$

Answer: D

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7. Melting point of calcium halides decreases in the order

A. $CaF_2 > CaCl_2 > CaBr_2 > CaI_2$

B. $CaI_2 > CaBr_2 > CaCl_2 > CaF_2$

C. $CaBr_2 > CaI_2 > CaF_2 > CaCl_2$

D. $CaCl_2 > CaBr_2 > CaI_2 > CaF_2$

Answer: A

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8. A major constituent of portland cement is?

A. Silica

B. Alumina

C. Iron oxide

D. Magnesia

Answer: A

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9. In alkaline earth metals, the electrons are more firmly held to the nucleus and hence

A. Ionization enthalpy, of alkaline earth metals is greater than that of alkali metals

B. Alkaline earths are less abundant in nature

C. Reactivity of alkaline earth metals is greater than that of alkali metals

D. Atoms of alkaline earth metals are bigger in size than alkali metals

Answer: A

 Watch Video Solution

10. The density of calcium is less than that of magnesium because.

A. Nuclear charge of calcium is more than magnesium

B. Vacant 3d-orbital is present in calcium

C. Size of calcium is less than magensium

D. None of the above

Answer: B

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11. "Be" differs from rest of the elements of the IIA group due to

A. small size

B. low electro negativity

C. presence of vacant 'd' orbital

D. Absence of vancent 'd' orbitals

Answer: A::D

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12. Which of the following compounds ae correctly related

A.

Compound	use
$MgSO_4 \cdot 7H_2O$	Mordant in dying fabrics

B.

Compound	use
$Ca(H_2PO_4)_2$	Soluble phosphate fertilizer

C.

Compound	use
$BaSO_4$	paint pigment

D. $(\text{Compound, use}), \left(Mg(OH)_2, \text{Milk of megnesia}\right)$

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

Watch Video Solution

13. Which of the following is/are corret statements ?

A. Mg burns in air releasing dazzling light rich in UV rays

B. $CaCl_2 \cdot 6H_2O$ when mixed with ice gives freezing mixture

C. Mg' cann't form complexes

D. "Be" can form complexes due to is very small size

Answer: A::B::D

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14. The incorrect statements (S) is/are

A. $BeCl_2$ is an ionic compound

B. $BeCl_2$ can form dimer

C. $BeCl_2$ is an electron deficient compound

D. $BeCl_2$ has seesaw shape

Answer: A::D

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15. Select the incorrect statement about Barium

A. It shows photo electric efect

B. It is silvery white metal

C. Its ionisation energy is greater than radium

D. It forms $Ba(NO_3\_(2)$ which is used in the preperation of green fire

Answer: A::C

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16. Group-II elements react with water evolving hydrogen. This reactivity increases down the group from Be to Ba. They displace hydrogen from acids except Be with oxygen Be, Mg and Ca form monoxides while Sr, Ba and Ra form peroxides on heating with hydrogen, they form metal hydrides except Be with carbon, they form carbides on heating such as acetylides, methanides and allylides. When heated with

halogens they form halides having different properties.

Ionic hydride is not formed by

A. Be

B. Ca

C. Ba

D. Sr

Answer: A

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17. Group-II elements react with water evolving hydrogen. This reactivity increases down the group from Be to Ba. They displace hydrogen from acids except Be with oxygen Be, Mg and Ca form monoxides while Sr, Ba and Ra form peroxides

on heating with hydrogen, they form metal hydrides except Be with carbon, they form carbides on heating such as acetylides, methanides and allylides. When heated with halogens they form halides having different properties.

Which of the following alkaline earth metal hydroxide is amphoteric in character ?

A. $Be(OH)_2$

B. $Ca(OH)_2$

C. $Sr(OH)_2$

D. $Ba(OH)_2$

Answer: A

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18. Group-II elements react with water evolving hydrogen. This reactivity increases down the group from Be to Ba. They displace hydrogen from acids except Be with oxygen Be, Mg and Ca form monoxides while Sr, Ba and Ra form peroxides on heating with hydrogen, they form metal hydrides except Be with carbon, they form carbides on heating such as acetylides, methanides and allylides. When heated with halogens they form halides having different properties.

Least ionic carbide is formed by

A. Be

B. Mg

C. Ca

D. Sr

Answer: A

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19. BeO and $Be(OH)_2$ are amphoteric while the oxides and hydroxides of other alkaline earth metals are basic. The solubility of hydroxides increases as we move down the group from Be to Ba but the solubility of sulphates and carbonates decreases in that order the thermal stability of carbonates and sulphates of alkaline earth metals increases from Be to Ba as we move from top to bottom in the group. Which of the following metal carbonates decompses on heating ?

A. $MgCO_3$

B. Na_2CO_3

C. K_2CO_3

D. Rb_2CO_3

Answer: A

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20. BeO and $Be(OH)_2$ are amphoteric while the oxides and hydroxides of other alkaline earth metals are basic. The solubility of hydroxides increases as we move down the group from Be to Ba but the solubility of sulphates and carbonates decreases in that order the thermal stability of carbonates and sulphates of alkaline earth metals increases from Be to Ba as we move from top to bottom in the group. The solubility in water of sulphates down the Be group is $Be > Mg > Ca > Sr > Ba$ this is due to

A. High heat of solution for smaller ions like $3a^{2+}$

B. Increasing molecular weight

C. decreasing lattice energy

D. Increase in melting points

Answer: A

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21. BeO and $Be(OH)_2$ are amphoteric while the oxides and hydroxides of other alkaline earth metals are basic. The solubility of hydroxides increases as we move down the group from Be to Ba but the solubility of sulphates and carbonates decreases in that order the thermal stability of carbonates and sulphates of alkaline earth metals increases

from Be to Ba as we move from top to bottom in the group.

Which of the following is strongest base ?

A. $Al(OH)_3$

B. $Mg(OH)_2$

C. $Ca(OH)_2$

D. $Ba(OH)_2$

Answer: D

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22. Match the following columns

Column-I	Column-II
A) Barium metal	P) $CaCO_3$
B) Calcite	Q) $BaSO_4$
C) Nitrolim	R) NH_3
D) Fertilizer	S) $CaCN_2+C$

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23. Match the following columns

Column-I	Column-II
A) $Ca_3(PO_4)_2$	P) Kidney stones
B) $CaC_2O_4 \cdot H_2O$	Q) Tooth enamel
C) $Ca_5(PO_4)_3OH$	R) Phosphorite
D) $Ca_5(PO_4)_3F$	S) Bones

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24. $\underset{[S]}{\left[M(NH_3)_6\right]^{2+}} \rightarrow \underset{[S]}{M(NH_2)_2} + x\underset{(g)}{NH_3} + y\underset{(g)}{H_2}$

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25. Which coordinated numbered complexes are formed by EDTA with most metal ions in solution

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26. For a good quality cement the ratio of $(CaO)L$ (lime quick) to SiO_2, Al_2O_3 and Fe_2O_3 is

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Additional practice exercise(Level-I(Main))

1. Be reacts with excess of caustic soda to form

A. $Be(OH)_2$

B. BeO

C. $Na_2\left[Be(OH)_4\right]$

D. $Be(OH)_2.\ BeCO_3$

Answer: C

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2. $CaCO_3 + HNO_3 \rightarrow$ products

A. $Ca(NO_3)_2, H_2O, CO_2$

B. $Ca(NO_3)_2, H_2CO_3$

C. Ca_3N_2, CO_2, H_2O

D. None of these

Answer: A

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3. $CaSO_4$ can be prepared by reaction of any calcium salt with

A. H_2SO_4

B. Soluble sulphate

C. Both (1) and (2)

D. None of these

Answer: C

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4. Aqueous solution of $BeCl_2$ is

A. Acidic

B. Basic

C. Neutral

D. None of these

Answer: A

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5. The electric cookers have a coating that protects them against fire. The coating is made of

A. Heavy lead

B. Zincoxide

C. MgO

D. Na_2SO_4

Answer: C

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6. Which ion is present in bones and teeth as apatite ?

A. Mg^{2+}

B. Ca^{2+}

C. Al^{3+}

D. Ba^{2+}

Answer: B

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7. Formula of enamel on teeth is

A. $CaCO_3$

B. $Ca_3(PO_4)_2$

C. $CaCl_2$

D. $3Ca_3(PO_4)_2.Ca(OH)_2$

Answer: D

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8. The composition of magnalium Alloy is

A. $Mg(1-15\,\%), Al(85-99\,\%)$

B. $Mn(25-30\,\%)$

C. $Mo\{20\,\%\}, W\{80\,\%\}$

D. None of these

Answer: A

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9. Which of the following is used as purgative in medicine.

A. $MgSO_4.7H_2O$

B. $CaSO_4.7H_2O$

C. $ZnSO_4.2H_2O$

D. $MnSO_4$

Answer: A

Watch Video Solution

10. Which metal ion is present in chlorophyl the green pigment of plants

A. Ca^{2+}

B. Be^{2+}

C. Mg^{2+}

D. Al^{3+}

Answer: C

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Additional practice exercise(Level-II(Advanced))

1. Which of the following statement is incorrect

A. Be and Mg are inert to oxygen and H_2O

B. Concentrated solutions of alkaline earth metals in NH_3 are bronze coloured

C. Ca, Sr and Ba reacts with cold H_2O forming hydroxides and liberating H_2 gas

D. Oxides and hydroxides of alkaline earth meals are more ionic and more basic than that of alkali metals.

Answer: D

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2. The carbide of which of the following metals on hydrolysis give allylene

A. Be

B. Ca

C. Al

D. Mg

Answer: D

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3. The component of cement that has properly of setting instantenously in the presence of H_2O and imparting internal strength to cement is

A. Tri calcium aluminate

B. Tri calcium silicate

C. Tetra calcium silicate

D. Zypsum

Answer: A

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4. The compound insoluble in acetic acid acid is

A. CaO

B. $CaCO_3$

C. Calcium oxalate

D. $Ca(OH)_2$

Answer: C::D

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5. Which of the following metals rendered passive with Conc.

HNO_3

A. Be

B. Na

C. Mg

D. Ba

Answer: A

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6. Which of the following equations are correct

A. $MgCl_2 \cdot 2H_2O \xrightarrow{\Delta} Mg(OH)_2 + 2HCl$

B. $MgCl_2 \cdot 6H_2O \xrightarrow{\Delta} MgCl_2 \cdot 2H_2O + 4H_2O$

C. $MgO + C + Cl_2 \rightarrow MgCl_2 + CO$

D. $MgSO_4 \cdot 7H_2O \xrightarrow{100k} MgSO_4$

Answer: A::B::C

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7. Which of the following compounds of Be has polymeric structure

A. BeH_2

B. $BeCl_2$

C. $Be(OH)_2$

D. $Be(NO_3)_2$

Answer: A::B

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8. Which of the following statements are false

A. $Ca(OH)_2$ is called slaked lime

B. Mg^{2+} and Ca^{2+} ions are responsible for the transmission of electrical impulses along the nerve fibre

C. Ca^{2+} ion is present in chlorophyll pigment

D. The enamel on teeth is a double salt of Mg

Answer: C::D

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9. $MgSO_4.7H_2O \xrightarrow{423k} A \xrightarrow{473k} BB \xrightarrow{\Delta} C + 2SO_2 + O_2$

Which of the following options are incorrect.

A. $\begin{matrix} A & B & C \\ MgSO_4 \cdot H_2O & MgSO_4 & MgO \end{matrix}$

B. $\begin{matrix} A & B & C \\ MgSO_4 & MgO & MgSO_4 \cdot H_2O \end{matrix}$

C. $(A, B, C), \left(MgO, Mg(OH)_2, MgCO_3\right)$

D. $(A, B, C), \left(Mg(OH)_2, MgSO_4, MgSO_4 \cdot H_2O\right)$

Answer: B::C::D

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10. Which of the following statements are correct

A. "Be" like 'Al' is rendered passive on treatment with Conc

HNO_3

B. Both "Be" and 'Al' don't impart any folouration to the

bunsen flame

C. Both "Be" and 'Al' form carbides which on hydrolysis liberate CH_4 gas

D. Both form halides by the direct reaction of metal and halogen which contain bridge bonds

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

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11. In chlorophyll pigment how many number of nitrogen atoms surrounds the central 'Mg' atom ?

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12. $CaCl_2.6H_2O \xrightarrow{473k} CaCl_2.xH_2O \xrightarrow{\text{fusion}} CaCl_x$ is

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Practice sheet (Advanced)

1. Which of the following are arranged in increasing order of solubilities ?

A. $CaCO_3 < KHCO_3 < NaHCO_3$

B. $NaHCO_3 < KHCO_3 < CaCO_3$

C. $KHCO_3 < NaHCO_3 < CaCO_3$

D. $CaCO_3 < NaHCO_3 < KHCO_3$

Answer: D

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2. Amongest the following hydroxides, the which has the lowest value of K_{sp} at ordinary temperature (about $25^{\circ}C$) is

A. $Mg(OH)_2$

B. $Ca(OH)_2$

C. $Ba(OH)_2$

D. $Be(OH)_2$

Answer: D

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3. The cation which gives a yellow precipitate with potassium chromate is

A. NH_4^+

B. Ba^{2+}

C. Ca^{2+}

D. Na^+

Answer: B

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4. Calcium metal is used to produce high vaccum because it

A. can remove water

B. can remove both O_2 and N_2

C. is a good reductant

D. is highly electropositive

Answer: B

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5. During military operation hydrogen is generally obtained by the cation of water on

A. BeH_2

B. CaH_2

C. $NaBH_4$

D. LiA/H_4

Answer: B

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6. Which of the following are commonly used in making tooth paste.

A. $Mg(OH)_2$

B. $MgCO_3$

C. $CaCl_2$

D. $Ca(NO_3)_2$

Answer: A::B

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7. In curing cement plasters, water is sprinkled from time to time. Which of the following statements are incorrect.

A. keeping it cool

B. converting sand in to silicic acid

C. hydrated sand gravel mixed with cement

D. developing interlocking neddle like crystals of hydrated silicates

Answer: A::B::C

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

A. BeO

B. MgO

C. CaO

D. None of these

Answer: B::C

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9. Yellow phosphrous on reaction with $Ca(OH)_2$ gives

A. $Ca(H_2PO_4)_2$

B. $Ca(H_2PO_2)_2$

C. PH_3

D. PH_5

Answer: A::C

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10. Which of the following metals dissolve in liquid NH_3

A. Sr

B. Ca

C. Ba

D. Be

Answer: A::B::C

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11.

$$MgSO_4.7H_2O \xrightarrow{150^\circ} MgSO_4.xH_2O \xrightarrow{200^\circ} MgSO_4.yH_2O$$

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12. $BeC + 4H_2O \rightarrow Be(OH)_2 + CH_4$

$CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + X$

$Mg_2C_3 + 2H_2O \rightarrow Mg(OH)_2 + Y$

The total no. of π bonds present in X and Y

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Exercise 3.1.1

1. Discuss the general characteristics and gradation in properties of alkaline earth metals.

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2. Write the electronic configuration of group 2 elements .How is the configuration useful in explaning the reactivity and oxidation states .

Watch Video Solution

3. Comment on the ionisation potentials of alkaline earth metals .

Watch Video Solution

4. Write on the flame colours of the salts of alkaline earth metals .

Watch Video Solution

5. How does alkaline earth metals react with (a) water and (b) air .

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6. Discuss the basic nature of oxides and hydroxides of alkaline earth metals .Write necessary equations .

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7. Comment on the nature , stability ,solubility and conductivity of alkaline earth metal halides .

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8. Write about the stability and solubility of carbonates of group 2 elements .

Watch Video Solution

9. How beryllium differs from the other alkaline earth metals .

Watch Video Solution

10. Write the similarity in the behaviour of beryllium and aluminium .

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11. The fluorides of alkaline earth metals are relatively less soluble than their respective chlorides in water. Why?

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

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13. When an alkali metal dissolves in liquid ammonia the solution can acquire different colours. Explain the reasons for this type of colour change.

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14. How would you expalain the following observation?

(i)BeO is almost insoluble but `BeSO

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Exercise 3.1.2

1. Write four important minerals of magnesium .

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2. The best electrolyte for the extraction of magnesium metal is

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3. How is magnesite used for the electroytic preparation of magnesium ?

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4. Discuss different stages of extraction of magnesium metal from sea water .

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5. How is magnesia reduced to metal ? Write the necessary chemical equations .

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6. How does magnesium metal react with (a) nitric acid , (b) alkyl halide (c) silver nitrate and (d) nitric oxide ?

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7. Write any four uses of magnesium metal .

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8. Write the composition and uses of following alloys of magnesium metal : (a) magnalium and (b) electron .

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Exercise 3.1.3

1. Write the uses of magnesia and magnesium hydroxide .

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2. Write the important uses of epson salt .

Watch Video Solution

3. How is magnesium chloride prepared ? Write its important uses .

Watch Video Solution

4. What happens when epsom is strongly heated ?

Watch Video Solution

Exercise 3.1.4

1. How is calcium ,carbonate available in nature ? Write its uses .

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2. Write different uses of quick lime and milk of time .

Watch Video Solution

3. How is gypsum prepared ? Write its uses .

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4. How is plaster of paris prepared ? What is setting of plaster of paris ?

Watch Video Solution

5. Write a short note on mortar .

Watch Video Solution

6. Write the composition of cement .

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QUESTION FOR DESCRIPTIVE ANSWERS

1. Compare the electropositivity of alkaline earth metals with alkali metals.

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2. Write the order of density of alkaline earth metals. Why density of calcium is least?

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3. Discuss the nature and solubility of halides of group 2 elements.

Watch Video Solution

4. Write on the reactions of alkaline earth metals with different non-metals and ammonia. Account for the differences.

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5. How magnesium carbonate is prepared by different methods ? What happens when carbondioxide is passed through magnesium carbonate? Write any of its three important uses.

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6. Differentiate between the properties of alkaline earth and alkali metals.

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7. Discuss the anomalous behaviour of beryllium in group IIA. How beryllium hydride is prepared? Also discuss the bonding in beryllium hydride.

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8. How are alkanes prepared using magnesium metal ?

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9. Write different action of chlorine gas on slaked lime under different condition.

Watch Video Solution

10. What are allylides ? Give suitable examples.

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11. Why alkaline earth metals donot from monovalent ions ?

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12. Draw the structures of $BeCl_2$ and BeH_2 in the solid state.

Watch Video Solution

Watch Video Solution

13. Why $BeCl_2$ is easily hydrolysed ?

Watch Video Solution

14. How is divalent magnesium related to plant material ?

Watch Video Solution

15. Write chemistry involved in the setting of plaster of paris.

Watch Video Solution

16. A solid 'X' when heated evolves a colourless gas which does not support combustion. The residue is dissolved in water to form 'Y' which can be used during construction and white washing. When excess carbon dioxide is bubbled through the solution of 'Y' , compound 'Z' is formed. When 'Z' is heated gently, 'X' is reformed. Identify 'X' and discuss the reactions.

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17. Marble stone is not treated with diluted sulphuric acid to prepare carbon dioxide. Why?

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18. In the manufacture of magnesium by carbon reduction of MgO, the product is cooled in a stream of an inert gas. Why?

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19. Anhydrous magnesium chloride cannot be prepared by heating hydrated magnesium chloride. Why ?

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20. How magnesium carbonate is prepared by different methods ? What happens when carbondioxide is passed through magnesium carbonate? Write any of its three important uses.

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21. Write the important constituents of portland cement? What are the important raw materials for making this ?

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22. What are the differences between slaked lime, milk of lime and lime water ?

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SUBJECTIVE EXERCISE 1 (SHORT ANSWER TYPE QUESTIONS)

1. Write a note on the anomalous behaviour of beryllium.

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2. In what respect the halides of Be differ from those of other elements of the group ?

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3. How are ionization potentials of alkaline earth metals varying from Be to Ba? Why do the 2^{nd} group elements have higher IE values than 1^{st} group elements ?

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4. Describe the method of preparing cement ?

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5. Imagine what would happen if gypsum is gradually heated to about $500^{\circ} C$.

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6. Write a note an the importance of Mg^{+2} in biology

Watch Video Solution

7. What is the importance of Ca^{+2} in the functioning of the cell ?

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SUBJECTIVE EXERCISE 1 (VERY SHORT ANSWER TYPE QUESTIONS)

1. Why does the first elements in a group show anomalous behaviour. Give a reason.

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2. What elements show diagonal relationship? Give an example

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3. Write the electronic configurations of Ca and Sr

Watch Video Solution

4. Write two important minerals of calcium. Give their composition

Watch Video Solution

5. Write different forms of calcium carbonate available.

Watch Video Solution

6. Write on the thermal stability of alkaline earth metal carbonates.

Watch Video Solution

7. What is plastar of paris? How is it prepared ?

Watch Video Solution

8. Write the setting of cement.

Watch Video Solution

9. What is quick lime ?

Watch Video Solution

10. Write uses of quick lime and slaked lime

Watch Video Solution

11. Write the uses of plaster of paris.

Watch Video Solution

OBJECTIVE EXERCISE - 1

1. The most abundant element among the following is

A. Mg

B. Ca

C. Sr

D. Ra

Answer: B

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2. Which of the following is thermally more stable

A. CaO_2

B. SrO_2

C. BaO_2

D. All are equally stable

Answer: C

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3. Which of the following is Radioactive element

A. Ra

B. Ba

C. Ca

D. Sr

Answer: A

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4. The alkaline earth metal that forms mainly covalent compounds is

A. Mg

B. Be

C. Ca

D. Ba

Answer: B

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5. Beryllium resembles the following element more than the members of its own family

A. Mg

B. Al

C. Li

D. Si

Answer: B

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Watch Video Solution

6. From Be to Ba electropositive or metallic character

A. Increases

B. Decreases

C. Remains same

D. Cannot be predicted

Answer: A

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7. Which has a strong reducing character among the following

A. Be

B. Mg

C. Ca

D. Ba

Answer: D

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8. Among the following amphoteric oxide is

A. BeO

B. Al_2O_3

C. ZnO

D. All the above

Answer: D

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9. The correct order of polarising ability of cations of Alkaline earth metals is

A. $Be^{2+} > Ca^{2+} > Mg^{2+} > Ba^{2+}$

B. $Be^{2+} < Mg^{2+} > Ca^{2+} = Ba^{2+}$

C. $Be^{2+} < Mg^{2+} > Ca^{2+} < Ba^{2+}$

D. $Ba^{2+} < Ca^{2+} < Mg^{2+} < Be^{2+}$

Answer: D

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10. Beryllium differs from other alkaline earth metals because of

A. Small size and High EN

B. Large size and Low EN

C. Small size Low EN

D. Large size High EN

Answer: A

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11. Which of the following is a true peroxide

A. NO_2

B. MnO_2

C. RbO_2

D. BaO_2

Answer: D

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12. Which oxide is more basic among the following

A. BeO

B. MgO

C. CaO

D. BaO

Answer: D

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13. Which is more soluble among the following

A. BeO

B. MgO

C. CaO

D. BaO

Answer: D

Watch Video Solution

14. The most basic hydroxide among the following is

A. $Mg(OH)_2$

B. $Ca(OH)_2$

C. $Be(OH)_2$

D. $Ba(OH)_2$

Answer: D

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15. The covalent halide among the following is

A. BeF_2

B. $MgCl_2$

C. $CaCl_2$

D. $BaCl_2$

Answer: A

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16. Ionic nature of group 2 hydrides is

A. $BeH_2 > MgH_2 > CaH_2 > SrH_2 > BaH_2$

B. $BeH_2 < MgH_2 < CaH_2 < SrH_2 < BaH_2$

C. $BeH_2 > MgH_2 < CaH_2 < SrH_2 < BaH_2$

D. None

Answer: B

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17. The halide that is highly soluble in H_2O among the following is

A. BeF_2

B. CaF_2

C. MgF_2

D. BaF_2

Answer: A

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18. $MgCl_2.XH_2)O, CaCl_2.YH_2O$ and $BaCl_2.ZH_2O.$

The values of X, Y and Z are respectively

A. 2, 6, 8

B. 8, 6,2

C. 2, 4, 8

D. 4, 6, 8

Answer: B

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19. Which of the following is more soluble in ether?

A. $BeCl_2$

B. $CaCl_2$

C. $SrCl_2$

D. $BaCl_2$

Answer: A

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20. (A): Oxides of alkaline earth metals are less basic than oxides of alkali metals

(R) : Alkaline earth metals are less electropositive than alkali metals

A. A and R are true, and R is the correct explanation of A

B. A and R are true, but R is not the correct explanation of A

C. A is true and R is false

D. A is false and R is true

Answer: A

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21. Which of the following salts does not impart a colour to the flame ?

A. $LiCl$

B. KCl

C. $MgCl_2$

D. $CaCl_2$

Answer: C

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22. Which element of group 2 is used in treatment of cancer ?

A. Magnesium

B. Radium

C. Strontium

D. Beryllium

Answer: B

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Watch Video Solution

23. (A): $BeSO_4$ and $MgSO_4$ are readily soluble in water

(R): The greater hydration enthalpy of Be^{2+} and Mg^{2+} ions overcome the lattice enthalpy of $BeSO_4$ and $MgSO_4$

A. Both A and R are true, R is the correct explanation of A

B. Both A and R are true, R is not the correct explanation of A

C. A is true but R is false

D. A is false, but R is true

Answer: A

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24. In alkaline earth metals, the electrons are more firmly held to the nucleus and hence

A. Ionization energy of alkaline earth metlas is greater than that of alkali metals

B. Alkaline carths are less abundant in nature

C. Reactivity of alkaline earth metals is greater than that if alkali metals

D. Atoms of alkaline earth metals are bigger in size than alkali metals

Answer: A

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25. Which of the following is true for magnesium?

A. It is more electropositive than sodium

B. It is manufactured by electrolysis of of aqueous magnesium chloride

C. It is strong reducing agnet

D. It resembles, in chemical properties, with its diagonally placed element boron in 13 group of the periodic table

Answer: C

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26. In case of alkaline earth metals, the oxidation state more than two is not observed because

A. They have only two electrons in the outer most shell

B. The s-orbital can accommodate only two electrons

C. The removal of third electron involves breaking up of noble gas configuration and the energy needed for this purpose is extremely high

D. None of the above

Answer: C

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27. One of the following statements is incorrect

A. Elements of group 2 are good conductors of electricity and heat

B. Compounds of group 2 elements are diamagnetic in nature

C. The salts of group 2 elements are more heavily hydrated than those of elements of group 1

D. Elements of group 2 are more electropoșitive than group 1 elements

Answer: D

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28. A piece of magnesium ribbon was heated to redness in an atmosphere of nitrogen and then cooled with water. The gas evolved is

A. Ammonia

B. Hydrogen

C. Nitrogen

D. Oxygen

Answer: A

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29. BeF_2 is highly soluble in water whereas the fluorides of other alkaline earth metals are almost insoluble because

A. BeF_2 is ionic in nature

B. BeF_2 is covalent in nature

C. Hydration energy of BeF_2 is much higher than its lattice energy

D. Lattice energy of BeF_2 is much higher than that of its hydration energy

Answer: C

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30. A substance which gives a brick red flame and breaks down on heating to give both oxygen and a brown gas is

A. Calcium carbonate

B. Magnesium nitrate

C. Sodium nitrate

D. Calcium nitrate

Answer: D

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31. Which of the following statements is false?

A. Strontium decomposes water readily than beryllium

B. Barium carbonate melts at a higher temperature than calcium carbonate

C. Barium hydroxide is more soluble in water than magnesium hydroxide

D. Beryllium hydroxide is more basic than barium hydroxide

Answer: D

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32. Which of the following statements is false?

A. $BeCl_2$ is a linear molecule in vapour state but it is polymer in the solid state

B. Carbides of both Be and Ca react with water to form acetylene

C. Oxides of both Be and Al are amphoteric

D. Flame test in not given by Mg salts

Answer: B

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33. The activity of alkaline earth metals as reducing agents

A. increases from Be to Ca and decreases from Ca to Ba

B. increase from Be to Ba

C. decreases from Be to Ba

D. decreases from Be to Ca and increases form Ca to Ba

Answer: B

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34. Beryllium hydride is obtained by

A. heating Be in atmosphere of H_2

B. the action of $BeCl_2$ with $LiAlH_4$

C. the action of Be with CaH_2

D. none of these

Answer: B

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35. Substance which absorbs CO_2 and violently reacts with H_2O with sound is

A. $CaCO_3$

B. CaO

C. H_2SO_4

D. ZnO

Answer: B

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36. Which pair of the following chlorides do not impart colour to the flame?

A. $BeCl_2$ and $SrCl_2$

B. $BeCl_2$ and $MgCl_2$

C. $CaCl_2$ and $BaCl_2$

D. $BaCl_2$ and $SrCl_2$

Answer: B

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37. The least ionic chloride is formed by

A. Mg

B. Ca

C. Be

D. Sr

Answer: C

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38. Which of the following on thermal decompo sition yields a basic as well as an acidic oxide?

A. $KClO_3$

B. Na_2CO_3

C. NH_4NO_3

D. $CaCO_3$

Answer: D

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39. The substance not likely to contain $CaCO_3$ is

A. dolomite

B. a marble statue

C. calcined gypsum

D. sea shells

Answer: C

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40. Which of the following elements does not form hydride by direct heating with dihydrogen?

A. Be

B. Mg

C. Sr

D. Ba

Answer: A

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41. Chlorophyll contains

A. Ca^{2+}

B. Mg^{2+}

C. Fe^{2+}

D. Fe^{3+}

Answer: B

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42. The calcium concentration in plasma is regulated by which harmones

A. Calcitonin and insulin

B. Clacitonin and parathyroid

C. Insulin and testosteron

D. Testosteron and progesteron

Answer: B

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43. Which of the following is correct

A) Ca^{+2} ions are necessary to blood clotting

B) Chlorophyll contains magnesium.

C) Ca^{+2} pace a role in nuro musclar function

A. A

B. B

C. C

D. All

Answer: D

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44. The wire in the flash bulbs is made up of

A. Mg

B. Ba

C. Cu

D. Ag

Answer: A

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45. The metal that is used as a deoxidiser in metallurgy is.

A. Sn

B. Pb

C. Cu

D. Mg

Answer: D

Watch Video Solution

46. The least soluble carbonate among the following is

A. Na_2CO_3

B. K_2CO_3

C. $CaCO_3$

D. Rb_2CO_3

Answer: C

Watch Video Solution

47. The carbonate which decomposes on heating is

A. Na_2CO_3

B. K_2CO_3

C. $MgCO_3$

D. Cs_2CO_3

Answer: C

Watch Video Solution

48. The decreasing order of hydration enthalpies of alkaline earth metal ions is

A. $Be^{2+} > Mg^{2+} > Ca^{2+} > Sr^{2+} > Ba^{2+}$

B. $Be^{2+} > Ba^{2+} > Mg^{2+} > Ca^{2+} > Sr^{2+}$

C. $Ba^{2+} > Sr^{2+} > Ca^{2+} > Mg^{2+} > Be^{2+}$

D. $Be^{2+} > Ca^{2+} > Sr^{2+} > Mg^{2+} > Ba^{2+}$

Answer: A

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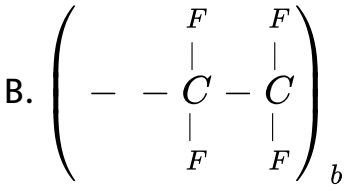
49. The compound formed when enamel on the surface of the teeth reacts with Fions

A. CaF_2

B. 

C. $3Ca_3(PO_4)_2.Ca(OH)_2$

D. $3Ca(PO_4)_2.CaF_2$

Answer: D

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50. Cement is a mixture of

A. Lime, sand and alumina

B. Limestone, sand and water

C. Dolomite, sand and water

D. Magnesite, slaked lime and water

Answer: A

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51. Quicklime is represented by the formula

A. $Ca(OH)_2$

B. CaO

C. $CaCO_3$

D. $CaHCO_3$

Answer: B

Watch Video Solution

52. The final product of setting of plaster of paris is as

A. Gypsum

B. Anhydride

C. Cement

D. Mortar

Answer: A

Watch Video Solution

53. What is the molecular formula of gypsum?

A. $CaSO_4.\ H_2O$

B. $CaSO_4.2H_2O$

C. $2CaSO_4.\ H_2O$

D. $CaCO_4.3H_2O$

Answer: B

Watch Video Solution

54. What is the molecular formula of plaster of paris?

A. $2CaSO_4.\ H_2O$

B. $2CaSO_4.2H_2O$

C. $CaSO_4.2H_2O$

D. $CaSO_4.3H_2O$

Answer: A

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55. A major constituent of portland cement is?

A. Silica

B. Alumina

C. Iron oxide

D. Magnesia

Answer: A

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56. Portland cement clinker has highest weight percentage of

A. dicalcium silicate

B. tricalcium silicate

C. dicalcium aluminate

D. tricalcium aluminate

Answer: B

Watch Video Solution

57. (A): $2-3\%$ Gypsum by weight is mixed with cement

(R) : Gypsum increases the rate of setting of cement

A. A and R are true, and R is the correct explanation of A

B. A and R are true, but R is not the correct explanation of A

C. A is true and R is false

D. A is false and R is true

Answer: C

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58. (A) : Setting of plaster of paris involves hydration

(R) : Plaster of paris is obtained by heating gypsum to $200^{\circ}C$

A. Both A and R are true, R properly explains A

B. Both A and R are true, R does not explain A

C. A is true, but R is false

D. A is false, but R is true

Answer: C

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59. Plaster of paris hardens by

A. Giving off CO_2

B. Changing into $CaCO_3$

C. Combining with water

D. Giving out water

Answer: C

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60. The ion useful in the muscle contraction is

A. Zn^{+2}

B. Mg^{+2}

C. Ca^{+2}

D. Ba^{+2}

Answer: C

Watch Video Solution

61. Ions necessary for blood clotting and for muscle contraction

A. Fe^{3+}

B. Fe^{2+}

C. K^{+}

D. Ca^{2+}

Answer: D

Watch Video Solution

62. The calcium concentration in plasma is regulated by which harmones

A. Insuline, Glucagon

B. Thyroxine, Testosteron

C. Esradiol Progesterone

D. Calcitonin, Parathyroid

Answer: D

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63. Which metal plays an important role in neutromuscular functions, interneuronal transmissions, cell membrane integrity and blood coagulation ?

A. Be

B. Mg

C. Ca

D. Ba

Answer: C

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OBJECTIVE EXERCISE - 2

1. CaC_2 react with H_2O to form which gas

A. CH_4

B. C_2H_4

C. C_2H_2

D. All

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2. $CaCO_3 \xrightarrow[1073]{\Delta} CaO + CO_2$

(Reverse reaction takes place). To prevent backward reaction

A. CO_2 is removed from reaction mixure

B. CO_2 is added to the reaction mixture

C. CaO is removed from reaction mixture

D. $CaCO_3$ is added to reaction mixture

Watch Video Solution

3. Covalent polymeric chloride among the following is

A. $CaCl_2$

B. $SrCl_2$

C. $BeCl_2$

D. $BaCl_2$

Watch Video Solution

4. Which of the following is the correct order of solubility in water ?

A. $BaSO_4 > SrSO_4 > CaSO_4 > MgSO_4$

B. $BaSO_4 > MgSO_4 > SrSO_4 > CaSO_4$

C. $MgSO_4 > CaSO_4 > SrSO_4 > BaSO_4$

D. $MgSO_4 > BaSO_4 > CaSO_4 > SrSO_4$

Watch Video Solution

5. Pick out the wrong statement

A. Be like Al does not dissolve in alkalies

B. Oxides of both Be and Al are amphoteric

C. Beryllium chloride like Aluminium chloride is covalent

D. Carbides of both Be and Al react with water evolving methane

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6. Both Be and Al become passive on reaction with concentrated. nitric acid due to

A. The non-reactive nature of the metal

B. The non-reactive nature of the acid

C. The formation of an inert layer of oxide on the surface of the metals

D. Formation of active layer of oxide on the surface of metals

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7. Alkaline earth metal compounds are less soluble in water than the corresponding alkali metal compounds because the alkaline earth metals have

A. Lower lattice energies

B. Higher ionization energies

C. Higher covalent character

D. Higher ionic character

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8. The first ionization energies of alkaline earth metals are higher than those of the alkali metals. This is because

A. There is an increase in the nuclear charge of the alkaline earth metals

B. There is decrease in the nuclear charge of the alkaline earth metals

C. There is no change in the nuclear charge

D. There is an increase in nuclear charge of alkali metals

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9. Which of the following is true

i) Be is not affected by dry air

ii) Be is amphoteric metal

iii) Be has a maximum covalency Four

A. i,ii are correct

B. i, ii, iii, are correct

C. ii,iii are correct

D. i,iii are correct

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10. BeF_2 is highly soluble in water, whereas the fluorides of other alkaline earth metals are almost insoluble because

A. BeF_2 is ionic in nature

B. BeF_2 is covalent in nature

C. Hydration energy of BeF_2 is much higher than lattice energy

D. Lattice energy of BeF_2 is much higher than its hydration energy

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11. Among the following the standard oxidation potential is highest for

A. Be

B. Mg

C. Ca

D. Ba

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12. The metal which imparts Brick red colour to flame is

A. Be

B. Mg

C. Ca

D. Ba

Watch Video Solution

13. Alkaline earth metals exhibit $+2$ oxidation state in aqueous solution due to

A. small size of metal atoms

B. their hydration energies being higher than second ionisation potential

C. their hydration energy being less than second ionisation potential

D. their low second ionisation potential

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14. Following are some statements about alkaline earth metals

I) The electronegativity of Ca, Sr, Ba is almost same

II) Be and Mg do not give flame colors

III) The most abundant alkaline earth metal is Ca in earth's crust

The correct combination is

A. I, II, III correct

B. I, II correct

C. II, III correct

D. I, III correct

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15. The decomposition temperature of $BaCO_3(A), MgCO_3(B)$ and $CaCO_3(C)$ follow the order

A. $C > A > B$

B. $A > C > B$

C. $C > B > A$

D. $B > C > A$

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16. Which of the following alkaline earth metal is used for making windows of X-ray tubes.

A. Be

B. Mg

C. Ca

D. Ba

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17. Which one of the following statements is correct

A. Beryllium exhibits a coordination number of six

B. Chlorides of both beryllium and alumi nium have bridged chloride strucutre in solid phase

C. The oxide with more percentage compo sition in cement is Fe_2O_3

D. An adult body contains more mass of Mg when compared to calcium.

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18. Which of the following has highest hydration enthalpy?

A. Be^{2+}

B. Mg^{2+}

C. Ca^{2+}

D. Ba^{2+}

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19. The following are the statements regarding polarisng power of IIA group cations

i) Be always forms covalent compounds due to high polarising power of Be^{+2} ions

ii) Be always form covalent compounds due to low polarising power of Be^{+2} ions

iii) Polarising power of IIA cations decreases from Be^{+2} ion to Ba^{+2} ion

The correcct combination is

A. i and ii are correct

B. ii and iii are correct

C. iii and i are correct

D. i,ii,iii are correct

Watch Video Solution

20. The decreasing order of second ionisation potential of K, Ca, Ba is

A. $K > Ca > Ba$

B. $Ca > Ba > K$

C. $Ba > K > Ca$

D. $K > Ba > Ca$

Watch Video Solution

21. Wrong statement of the following

A. BeF_2 is prepared by thermal decompo sition of $(NH_4)_2BeF_4$

B. $BeCl_2$ is prepared by the reaction among BeO, coke and Cl_2

C. Among alkaline earths Be is the strongest reducing agent

D. Compounds of alkaline earth metals are more extensively hydrated than those of alkali metals.

Watch Video Solution

22. Acetylide among the following is

A. CaC_2

B. Be_2C

C. Al_4C_3

D. Mg_2C_3

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23. Which of the following about Be is not correct?

A. Be has a high charge/size ratio

B. Be^{+2} has high hydration energy

C. Be forms $BeSO_4$ which is solube in water

D. Be does not show diagonal relationship with Al

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24. The following are some stements related to IIA group metals

I) The reaction with water increases from Be to Ba

II) The ionic nature of hydrides decreases from Be to Ba

III) The thermal stability of the peroxides increases with increase in cationic size

IV) The solubility of halides increases from Mg to Ba The correct statements are of

A. I and III

B. II and IV

C. I, II and III

D. I, III and IV

Watch Video Solution

25. The correct order of ability to fom complexes

A. $Ba^{2+} > Ca^{2+} > Mg^{2+} > Be^{2+}$

B. $Be^{2+} > Mg^{2+} > Ca^{2+} > Ba^{2+}$

C. $Be^{2+} > Ba^{2+} > Ca^{2+} > Mg^{2+}$

D. $Be^{2+} > Ca^{2+} > Ba^{2+} > Mg^{2+}$

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26. To a clear solution of compound (X), a solution of $BaCl_2$ is added and a heavy white precipitate is formed which does not dissolve in dil. HCI. The compound (X) is

A. A nitrate

B. A bromide

C. A sulphate

D. A carbonate

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27. Ca, Sr and Bagenerally form ionic compounds because of ?

A. Their high lattice energies

B. Low lattice energies

C. Their Large sizes

D. Their high ionisation energies

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28. Oxidation state of boron in Magnesium boride

A. -3

B. $+3$

C. $+1$

D. -1

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29. $BeCl_2 \xrightarrow{`x'} BeH_2$, Here 'X' is

A. $NaOH$

B. H_2

C. $LiAlH_4$

D. All

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30. Which of the following is a constituent of chewing gum ?

A. $CaCO_3$

B. Na_2CO_3

C. $CaSO_4$

D. $Ca(OH)_2$

Watch Video Solution

31. Which physical property is lower for alkaline earth metals as compared to alkali metals of the same period ?

A. Hardness

B. Melting point

C. Electropositivity

D. Ionisation potential

Watch Video Solution

32. Which is soluble in water

A. $BeSO_4$

B. $CaSO_4$

C. $SrSO_4$

D. $BaSO_4$

Watch Video Solution

33. In which of the following reactions Mg is not a reductant

A. $Mg + K_2O$

B. $Mg + CO_2$

C. $Mg + SO_2$

D. C_2H_5I

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34. Two metals (A) and (B) belongs to the same group of periodic table. Metal (A) forms an insoluble oxide but soluble sulphate. Metal (B) forms soluble oxide and insoluble sulphate. Then A and B are respectively

A. Ba, Be

B. Ca, Ba

C. Be , Ca

D. Be, Na

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35. Chemical A is used for water softening to remove temporary hardness. A reacts with sodium carbonate to generate caustic soda. When carbondioxide is bubbled through A, it turns cloudy. What is the chemical formula of A?

A. $CaCO_3$

B. CaO

C. $Ca(OH)_2$

D. $Ca(HCO_3)_2$

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36. Mg is an important component of which bio molecule occuring extensively in living world?

A. Haemoglobin

B. Chlorophyll

C. Florigen

D. ATP

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37. The carbonate having high decomposition temperature among the following is

A. $MgCO_3$

B. $BeCO_3$

C. $CaCO_3$

D. $BaCO_3$

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38. The most soluble hydroxide among the following is

A. $Be(OH)_2$

B. $Ca(OH)_2$

C. $Mg(OH)_2$

D. $Ba(OH)_2$

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39. X and Y are metal nitrates. X on heating liberafes O_2 only but Y on heating liberates NO_2 and O_2.X and Y are respectively

A. $NaNO_3, Mg(NO_3)_2$

B. $Mg(NO_3)_2 NaNO_3$

C. $NaNO_3, KNO_3$

D. $LiNO_3, Mg(NO_3)_2$

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40. Which of the following crystalline substance has the highest degree of hydration ?

A. Blue vitriol

B. Epsom salt

C. Washing soda

D. Gypsum

Watch Video Solution

41. Among the following which is extensively hydrated

A. $MgCl_2$

B. $CaCl_2$

C. $SrCl_2$

D. $BaCl_2$

Watch Video Solution

42. $CaCO_3 . MgCO_3 \xrightarrow{\Delta} X + Y + Z$

A.

X	Y	Z
$CaCO_3$	MgO	CO_2

B.

X	Y	Z
CaO	$MgCO_3$	CO_2

C.

X	Y	Z
CaO	MgO	CO_2

D.

X	Y	Z
Ca	Mg	$2CO_2$

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LECTURE SHEET (STRAIGHT OBJECTIVE TYPE QUESTIONS

1. The pair of elements with same electronegatively and stardard oxidation potential are

A. Mg and Ca

B. Ca and Sr

C. Ca and Ba

D. Ba and Be

Answer: B

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2. The magnetic nature of atoms (or) ions of IIA elements is

A. Paramagnetic

B. Ferromagnetic

C. Diamaagnetic

D. None

Answer: C

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3. Thermal stability of II A carbonates from $BeCO_3$ to $BaCO_3$

A. Increases

B. Decreases

C. May increases (or) decreases

D. Can not be in a regular

Answer: A

Watch Video Solution

4. Which of the following not avaible in nature heated

A. $BeCO_3$

B. $MgCO_3$

C. $SrCO_3$

D. $MgCI_2$

Answer: A

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5. CO_2 gas is not produced when the following is storngly heated

A. $CaCO_3$

B. $Ca(HCO_3)_2$

C. K_2CO_3

D. $MgCI_2$

Answer: C

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6. When burning magnesium splinter is placed in a jar containing the following gases then it continues to burn in

A. N_2

B. CO_2

C. SO_2

D. All of these

Answer: D

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7. The following salts of II A elements always exist in liquid state

A. $MgCO_3$

B. $Ca(HCO_2\_(2)$

C. $NaCO_3$

D. $NaHCO_3$

Answer: B

Watch Video Solution

8. Which of the following is correct regarding the solubility of alkaline earth halides

A. $BeCI_2 > MgCI_2 > CaCI_2 > SrCI_2 > BaCI_2$

B. $MgCI_2 < CaCI_2 < BeCI_2 < BaCI_2 < SrCI_2$

C. $BaCI_2 < MgCI_2 < CaCI_2 < BeCI_2 < SrCI_2$

D. $BaCI_2 < CaCI_2 < BeCI_2 < SrCI_2 < MgCI_2$

Answer: A

Watch Video Solution

9. Melting point is highest for

A. Be

B. Ba

C. Sr

D. Ca

Answer: A

Watch Video Solution

10. Which salt gives crimson colour in flame

A. $SrCI_2$

B. $CaCI_2$

C. $MgCI_2$

D. $BaCI_2$

Answer: A

Watch Video Solution

11. Which of the following metallic chloride has covalent character

A. $BeCI_2$

B. NaCI

C. $MgCI_2$

D. $BaCI_2$

Answer: A

Watch Video Solution

12. The II A carbonate that decomposes at room temperature of 25° C is

A. $CaCO_3$

B. $BeCO_3$

C. $BaCO_3$

D. $MgCO_3$

Answer: B

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13. Which of the following hydroxides is the strongest base.

A. $Ba(OH)_2$

B. $Mg(OH)_2$

C. $Ca(OH)_2$

D. CaOH

Answer: D

Watch Video Solution

14. The compound 'A' on heating gives a colourless gas and a residue. The residue dissolves in water to obtain (B). When excess of CO_2 is bubbled through aqueous solution of B gentle heating gives back A.

Compound 'C' is

A. $CaCO_3$

B. $Ca(HCO_3)_2$

C. $NaCO_3$

D. $NaHCO_3$

Answer: A

Watch Video Solution

15. The ion having highest mobility in aqueous solution is

A. Be^{+2}

B. Mg^{+2}

C. Ca^{+2}

D. Ba^{+2}

Answer: D

Watch Video Solution

16. The compounds(s) of alkaline earth metals, which are amphoteric in nature is / are

A. BeO

B. MgO

C. $Be(OH)_2$

D. $Mg(OH)_2$

Answer: A::C

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17. The correct statement is / are

A. $BeCI_2$ is a covalent compound

B. $BeCI_2$ is an electron deficient molecule

C. $BeCI_2$ can from dimer

D. the hybrid state of Be in $BeCI_2$ is sp^2

Answer: A::B::C

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18. The compound(s) which have -O-O- bond (s) is / are

A. BaO_2

B. Na_2O_2

C. CrO_5

D. Fe_2O_3

Answer: A::B::C

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19. Na_2SO_4 is water soluble but $BaSO_s$ is insoluble because

A. the hydration energy of Na_2SO_4 is higher than that of its lattice energy

B. the hydration energy of $NaSO_4$ is less than that of its lattice energy

C. the hydration energy of $BaSO_4$ is less than that of its lattice energy

D. the hydration energy of BaSO_(4)` is higher than that of its lattice energy

Answer: A::C

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20. Which of the following statements are false?

A. $BeCI_2$ is a linear molecule in the vapour state but it is polymeric in the solid state

B. Calcium hydride is called hydrolith

C. Oxides of both Be and Ca are amphoteric

D.

Answer: C::D

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21. Both alkali metals and alkaline earth metals are s - block elements. They resemble each other respect but still there are certain dismilariaties in their properties due to number of eletrons in the valence shell different atomic radii, ionisation enthalpy, electronegativity etc.

The correct sequence of increasing covalent character is

A. $BeCI_2 < NaCI < LiCI$

B. $NaCI < LiCI < BeCI_2$

C. $BeCI_2 < LiCI < NaCI$

D. $LiCI < NaCI < BeCI_2$

Answer: B

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22. Both alkali metals and alkaline earth metals are s - block elements. They resemble each other respect but still there are certain dismilariaties in their properties due to number of eletrons in the valence shell different atomic radii, ionisation enthalpy, electronegativity etc.

Which is least thermally stable ?

A. $LiCO_3$

B. $MgCO_3$

C. $BaCO_3$

D. $BeCO_3$

Answer: D

Watch Video Solution

23. Both alkali metals and alkaline earth metals are s - block elements. They resemble each other respect but still there are certain dismilariaties in their properties due to number of eletrons in the valence shell different atomic radii, ionisation enthalpy, electronegativity etc.

Which of the following statements are true for group ? electrons ?

A. Lattice enthalpy of oxides, carbonates, fluorides from Be to Ba

B. All form nitrides in air

C. The solubility of the hydroxides increase from Be to Ba

D. All are correct

Answer: A

View Text Solution

24. The oxides of alkali and alkali earth metals are basic and the their strenght increases down the group. The solubility of carbonates and sulphates of alkali and earth metals shown opposite trends. Only the carbonates of Li and alkaline earth metals decompose on heating. The bicarbonates of both alkali and alkali earth metals on heating give carbonates

The correct decreasing order of basic character of the oxides is

A. $K_2O > MgO > SrO > Cs_2O$

B. $Cs_2O > K_2O > SrO > MgO$

C. $MgO > SrO > K_2O > Cs_2O$

D. $Cs_2O > K_2O > MgO > SrO$

Answer: B

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25. The oxides of alkali and alkali earth metals are basic and the their strenght increases down the group. The solubility of carbonates and sulphates of alkali and earth metals shown opposite trends. Only the carbonates of Li and alkaline earth metals decompose on heating. The bicarbonates of both alkali and alkali earth metals on heating give carbonates

indentify the correct order of thermal stablities

A. $K_2O < MgCO_3 < CaCO_3 > BeCO_3$

B. $BeCO_3 < CaCO_3 < MgCO_3 < K_2CO_3$

C. $BeCO_3 < MgCO_3 < CaCO_3 < K_2CO_3$

D. $CaCO_3 < BeCO_3 < MgCO_3 < K_2CO_3$

Answer: C

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26. Match the following columns

Column - I	Column - II
A) Metal sulphate $\xrightarrow{\Delta}$ metal oxide + SO_2 + O_2	P) Ba
B) Metal cation + H_2SO_4 $\longrightarrow$ white ppt	Q) Sr
C) Metal + NH_3 $\xrightarrow{\text{(liquid)}}$ blue solution	R) Na
D) MCl_2 + conc.H_2SO_4 $\longrightarrow$ white ppt	S) Mg

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27. Match the following columns

Column - I	Column - II
A) $CaCO_3$	P) Dentistry, ornamental work
B) $Ca(OH)_2$	Q) Manufacture of sodium carbonate from caustic soda
C) CaO	R) Manufacture of high quality paper
D) $CaSO_4$	S) Used in white washing

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PRACTICE SHEET (LEVEL I) (STRAIGHT OBJECTIVE TYPE QUESTIONS)

1. The alkaline earth metal whose oxide is amphoteric from the following

A. Ba

B. Be

C. Sr

D. Ca

Answer: B

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2. Quick lime reacts with water to form

A. $CaCO_3$

B. $Ca(OH)_2$

C. CaH_2

D. All

Answer: B

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3. Comment on the solubility of calcium sulphate in water.

A. Increases with increases of temperature

B. Decreases with increases of temperature

C. Proportional to temperature

D. Temperature has no effect on solubility

Answer: B

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4. During setting of Plaster of Paris. Its volume

A. Decreases

B. Increases

C. Remains the same

D. First increases and then decreases

Answer: B

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5. The function of sand in mortar is

A. To decreases the hardness

B. To make the mass compacat

C. To decreases the plasiticity of the mass

D. To prevent excessive shrinkage which might result in cracsks

Answer: D

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6. The calcium compound used for setting the fractured bones in position is

A. $CaSO_4H_2O$

B. $2CaSO_4H_2O$

C. $CaSO_42H_2O$

D. $CaSO_4$

Answer: B

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7. The solubility of gypsum in water increases of ammonium sulphate due to the formation os

A. Mixed salt

B. Basic salt

C. Complex salt

D. Double salt

Answer: D

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8. Which has a strong reducing character among the following

A. Be

B. Mg

C. Ca

D. Ba

Answer: D

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9. Decreasing order of hydration energy of the following cations is

A. $Be^{+2} > Mg^{+2} > Ca^{+2} Ba^{+2}$

B. $Be^{+2} < Mg^{+2} < Ca^{+2} < Ba^{+2}$

C. $Ca^{+2} < Mg^{+2} < Be^{+2} < Ba^{+2}$

D. $Be^{+2} < Mg^{+2} > Ca^{+2} < Ba^{+2}$

Answer: A

Watch Video Solution

10. Which of the following sulphate is souble in water

A. $BeSO_4$

B. $CaSO_4$

C. SrO_4

D. $BaSO_4$

Answer: A

Watch Video Solution

11. Peroxide is not formed by

A. Be

B. Ca

C. Sr

D. Ba

Answer: A

Watch Video Solution

12. The following hydride is having more ionic nature

A. BeH_2

B. MgH_2

C. SrH_2

D. BaH_2

Answer: D

Watch Video Solution

13. The halide that is highly soluble in H_2O among the following is

A. BeF_2

B. CaF_2

C. MgF_2

D. BaF_2

Answer: A

Watch Video Solution

14. Which of the following metal reacts with cold water as well as hot water

A. Ca

B. Sr

C. Ba

D. All the above

Answer: D

Watch Video Solution

15. Which of the following do not respond to flame test

A. Be

B. Mg

C. Both (a) and (b)

D. Ca

Answer: C

Watch Video Solution

PRACTICE SHEET LEVEL II (STRAIGHT OBJECTIVE TYPE QUESTIONS)

1. An alkaline earth metal (M) gives a salt chlorine, which is souble in water at room temperature. It also forms an

insoluble sulphate whose mixture with a sulphide of a transtion metal is called lithopone a while pigment Metal M is

A. Ca

B. Mg

C. Ba

D. Sr

Answer: A

Watch Video Solution

2. Amongest the following hydroxides, the which has the lowest value of K_{sp} at ordinary temperature (about $25^{\circ} C$) is

A. $Ca(OH)_2$

B. $Mg(OH)_2$

C. $Sr(OH)_2$

D. $Be(OH)_2$

Answer: D

Watch Video Solution

3. The decreasing order of second ionisation potential of K, Ca, Ba is

A. $K > Ca > Ba$

B. $Ba > Ca > K$

C. $K > Ba > Ca$

D. $K = Ba = Ca$

Answer: A

Watch Video Solution

4. The correct order of solubility is

A. $CaCO_3 < KHCO_3 < NaHCO_3$

B. $KHCO_3 < CaCO_3 < NaHCO_3$

C. $NaHCO_3 < CaCO_3 < KHCO_3$

D. $CaCO_3 < NaHCO_3 < KHCO_3$

Answer: D

Watch Video Solution

5. The complex formation tendency of alkalie earth metals decreases down the group because

A. atomic size increases

B. availability of empty d and f - orbitals increases

C. nuclear charger to volume ratio increases

D. All the above

Answer: A

Watch Video Solution

6. The milk of magnesia used as an antacid is chemically

A. $Mg(OH)_2$

B. MgO

C. $MgCI_2$

D. $MgO + MgCI_2$

Answer: A

Watch Video Solution

7. $Y \xleftarrow{\Delta 205^\circ C} CaSo_4.2H_2O \xrightarrow{\Delta 120^\circ C} X$ X and Y are respectively

A. plaster of paris, dead burnta plaster

B. dead burnt plaster of paris

C. CaO and plaster of pairs

D. plaster of pairs mixture of gases

Answer: A

Watch Video Solution

8. A metal M readily forms water soluble and water insouble hydroxide $M(OH)_2$ Its oxide MO is amphoteric, hard and having high melting point. The alkaline earth metal M must Be

A. Mg

B. Be

C. Ca

D. Sr

Answer: B

Watch Video Solution

9. Among $MgCI_2RbCI$, $BaCI_2$ and $LICI$, the compounds with the higtest and the lowest % of ionic character are

A. $MgCI_2$ and $BaCI_2$

B. $RbCI$ and $MeCI_2$

C. $Baci_2$ and $MeCI_2$

D. $RbCI$ and $LiCI$

Answer: B

Watch Video Solution

10. Weakest base among KOH, $NaOHCaF(OH)_2$ and $Zn(OH)_2$ is

A. $Ca(OH)_2$

B. KOH

C. NaOH

D. $Zn(OH)_2$

Answer: D

Watch Video Solution

11. $BeCI_2 + LiAIH_4 \rightarrow X - LiCI + AICI_3$

A. X is LiH

B. X is BeH_2

C. X is $BeCI_2 2H_2O$

D. None

Answer: B

Watch Video Solution

12. The order of thermal stability of carbonates of HA group is

A. $BaCO_3 > SrCO_3 > CaCO_3 > MgCO_3$

B. $MgCO_3 > CaCO_3 > SrCO_3 > BaCO_3$

C. $CaCO_3 > SrCO_3 > BaCO_3 > MgCO_3$

D. $MgCO_3 = CaCO_3 > SrCO_3 = BaCO_3$

Answer: A

Watch Video Solution

13. A pair of substances which gives the same products on reaction with water is

A. Mg and Mgo

B. Sr and Sro

C. Ca and CaH_2

D. Be and BeO

Answer: C

Watch Video Solution

14. The high melting and high boiling element in IIA group elements is

A. Be, Ba

B. Mg, Ba

C. Be, Be

D. Ba, Ba

Answer: C

Watch Video Solution

15. Select the correct statement out of the following

A. CaF is soluble in water

B. $BaSO_4$ is soluble in water

C. $Ba(OH)_2$ is insolube in water

D. $MgSO_4$ is soluble in water

Answer: A

Watch Video Solution

16. Which of the following are inoic earbides ?

A. CaC_2

B. AI_4C_3

C. SiCiC

D. Be_2C

Answer: A::B::D

Watch Video Solution

17. Which of the following pair of elements will give superoxides and peroxides respectively when heated in excess of air?

A. K, Ba

B. Na, Rb

C. K, Rb

D. Na,Ba

Answer: C::D

Watch Video Solution

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

A. ReO

B. MgO

C. CaO and plaster of pairs

D. SrO

Answer: B::C::D

Watch Video Solution

19. Select the correct statement about harium :

A. it shows photoelectric effect

B. it is silvery while metal

C. It forms $Ba(NO_2)^2$ which is used in preparation of green fire

D. it ionisation energy is less than radium

Answer: B::C::D

Watch Video Solution

20. Mg and Zn have following resemblance :

A. MgO and ZnO are amphoteric

B. $MgCO_3 ZnCO_3$ both on heaating give corresponding oxide

C. both are used as electrons

D. both are used to prevent corrosion

Answer: B::C::D

Watch Video Solution

21. Quicklime and slaked lime are the cheapest and the most widely used bases for neutralising unwanted acids. Lime is used to neutralise acidic soils. A 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 hides and in water softening

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

A. Sodium carbonate

B. Quick lime

C. cone. H_2SO_4

D. Alcohol

Answer: B

Watch Video Solution

22. Quicklime and slaked lime are the cheapest and the most widely used bases for neutralising unwanted acids. Lime is used to neutralise acidic soils. A 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 hides and in water softening

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

A. $CaCO_3$

B. $Ca(HCO_3)_2$

C. $Ca(OH)_2$

D. $CaCI_2$

Answer: C

Watch Video Solution

23. Magnesium is a valuable, light weight used as a structural mataerial as well as in a alloys batteries and in chemical synthesis. Although magnesium is plentiful in earth.s crust, it

is mainly found in sea water (after sodium). There about 1.3 g of magnesium in every kilogram of sea water. The process for obtaining magnesium from sea water employs all three types of reactions, i.e. precipitation acid-base and redox reactions Preipitation reaction involves formation of

A. insouble $MgCO_3$ by adding Na_2CO_3

B. insouble $Mg(OH)_2$ by adding $Ca(OH)_2$

C. insouble in $MgSO_4$ by adding Na_2SO_4

D. insouble $MgCI_2$ By adding NaCI

Answer: B

Watch Video Solution

24. Magnesium is a valuable, light weight metal used as a structural material as well as in all batteries and in chemical synthesis. Although magnesium is plentiful in carth crust, it is ma found in the sea water after sedium. There is about 1.38 of magnesium in every kilogram of water. The process for obtaining magnesium from se water employs all three types of reach le... precipitation acid-hase and redor racions.

Acid-base reaction involves reaction between.

A. $MgCO_2$ and HCI

B. $Mg(OH)_2$ and H_2SO_4

C. $Mg(OH)_2$ and HCI

D. $MgCO_3$ and $NaCI$

Answer: C

Watch Video Solution

25. Magnesium is a valuable, light weight metal used as a structural material as well as in alloy hatteries and in chemical s . Although magnesium is plentiful in Earth s maire found in the sea water after sodium). There is about 1.3 8 of magnesium in every kilogram of se water. The process for obtaining magnesium from en water employs all three types of reaction Le precipitation, acid-base, and redox reactions Redox reaction takes place in the extraction of Mg :

A. In the electronlytic cell when fused $MgCI_2$ is subjected to electrolysis

B. When fused $MgCO_3$ is heated

C. When fused $MgCO_2$ is strongly heated

D. Both (b) and (c)

Answer: a

Watch Video Solution

26. How many of the following metals can from peroxides Be, Mg, Ca, Sr, Ba

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27. Among the following oxides, how many have NaCi type structure BeO, MgO, CaO, BaO, SrO

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28. Number of water molecules present in the hydrated state of $MgSO_4$

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29. Number of water molecule in 2 mole of plaster of pairs

Watch Video Solution

30. Number of moles of water required for the hydroysis of 1 mole of Be_2C

Watch Video Solution

ADDITIONAL PRACTICE EXERCISE (LEVEL -1 (MAIN)

1. A metal which shows properties similar to that of magnesium is

A. K

B. Na

C. Al

D. LI

Answer: D

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2. Baryta is

A. BaO

B. $Ba(OH)_2$

C. $SrSO_4$

D. $MgSO_4$ is soluble in water

Answer: A

Watch Video Solution

3. Strontia is

A. SrO

B. MgO

C. $SrCO_3$

D. $SrCO_4$

Answer: A

Watch Video Solution

4. Setting of plaster of paris involves

A. Dehydration

B. Oxidation

C. Combination with CO_2

D. Hydration

Answer: D

Watch Video Solution

5. Gypsum on heating beyond $200^{\circ} C$. Gives

A. Lime

B. Dead brunt gypsum

C. Ca

D. plaster of paris

Answer: B

Watch Video Solution

6. Slaked lime is

A. CaO

B. $CaCO_3$

C. $Ca(OH)_2$

D. $CaSO_4$

Answer: C

Watch Video Solution

7. Clay contains aluminimum silicate to an extent of

A. 0.05

B. 0.1

C. 0.15

D. 0.2

Answer: B

Watch Video Solution

8. Among the following amphoteric oxide is

A. BeO

B. AI_2O_2

C. ZnO

D. All the above

Answer: D

Watch Video Solution

9. Chrysobery is a mineral of

A. Mg

B. Ba

C. Be

D. Ra

Answer: B

Watch Video Solution

10. Which carbide liberates methane gas on hydrolysis

A. Be_2C

B. AI_4C_3

C. Both (a) and (b)

D. All the above

Answer: B

Watch Video Solution

11. The abundance of alkaline earathmetails in the earth crust is in the order of

A. $Ca > Mg > Ba > Sr > Be$

B. $Mg > Be > Ca > Sr > Ba$

C. $Ca > Mg > Bc > Ba > Sr$

D. $Ca > Bc > Mg > Sr > Ba$

Answer: A

Watch Video Solution

12. Which of the following halide is covalent

A. $BeCI_2$

B. $MgCI_2$

C. $CaCI_2$

D. $BaCI_2$

Answer: A

Watch Video Solution

13. Which of the following alkaline earth metal does not react with cold water but water

A. Mg

B. Be

C. Ca

D. Sr

Answer: B

Watch Video Solution

14. Which of the following is a amphoteric metal

A. Bc

B. Ca

C. Sr

D. Ba

Answer: A

Watch Video Solution

15. Ionic nature of hydrides is

A. $BeH_2 > MgH_2 > CaH_2 > SrH_2 > BaH_2$

B. $BeH_2 < MgH_2 < CaH_2 < SrH_2 < BaH_2$

C. $BeH_2 < MgH_2 < CaH_2 > SrH_2 < BaH_2$

D. $BeH_2 < MgH_2 < CaH_2 < SrH_2 < BaH_2$

Answer: B

Watch Video Solution

16. Beryllium differs from other alkaline earth metals because of

A. Small size and high EN

B. Large size and low EN

C. Small size low EN

D. Large size and high EN

Answer: A

Watch Video Solution

17. Magnesite is a mineral of

A. Be

B. Mg

C. Sr

D. Ba

Answer: B

Watch Video Solution

18. Calcination of limestone containing clay at high temperature is fusible slag is formed. The slag is

A. $CaSiO_3$

B. $Ca(OH)_2$

C. $Ca(HCO_3)$

D. $CaCI_2$

Answer: A

Watch Video Solution

19. Mortar is a mixture of

A. I part of slaked lime, 1 part of sand and water

B. 1 part of slaked lime, 3 part of sand and water

C. 3 parts of slaked lime, 3 parts of sand and water

D. 3 parts of slaked lime, 1 part of sane and water

Answer: B

Watch Video Solution

20. Hydraulic mortar is used as

A. Bleaching agent

B. Antiseptic

C. Building materal

D. All of these

Answer: D

Watch Video Solution

21. Which is not a use of plaster of pairs

A. It isused in the manufacture of crucibles and models

B. It is used for setting of fractured bones and teeth

C. It is used as good reducing agent

D. It is used in the manufacture of black board chalks

Answer: C

Watch Video Solution

22. Which ion is present in bones and teeth as apatite ?

A. Mg^{+2}

B. Ca^{-2}

C. AI_{+3}

D. Ba^{+2}

Answer: B

Watch Video Solution

23. Enamel on teeth is

A. $CaCO_3$

B. $CaCI_2$

C. $Ca_3(PO_4)_2$

D. $3Ca_3(PO_4)_2(OH)_2$

Answer: D

Watch Video Solution

24. Which of the following is a role of Ca^{+2} in biology

A. Ca^{+2} ions are necessaray for blood clothing

B. Ca^{+2} ions are necessary to maintain regular heart beating

C. Ca^{+2} ions are necessary for muscle contraction

D. All of these

Answer: D

Watch Video Solution

25. Enzymes like phosphohydrolases and phosphotransferases contain

A. Mg^{+2}

B. Ca^{+2} ions are necessary to maintain regular heart beating

C. Sr^2

D. Both (a) and (b)

Answer: A

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26. $CaCO_3 \xrightarrow[1073]{\Delta} CaO + CO_2$

(Reverse reaction takes place). To prevent backward reaction

A. CO_2 removed from reaction mixture

B. CO_2 is added to reaction mixture

C. CaO is removed from reaction mixture

D. $CaCO_3$ is added to reaction mixture

Answer: A

Watch Video Solution

27. Alkaline earth metals exhibit $+2$ oxidation state in aqueous solution due to

A. Smll size of metal atoms

B. Their hydration energies being than second inoisation potential

C. Their hydration enargy being less than second ionisation potential

D. Their low second ionisation potential

Answer: B

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28. Metal A when burnt in air forms only an oxide while metal B When brunt in air forms a mixture of oxide and nitride. A and B are

A. Mg and Ca

B. K and Mg

C. Be and Ca

D. Na and Ca

Answer: B

Watch Video Solution

29. IIA group metal oxides are less basic than IA group metal oxides because

A. II group metals are less electropositive than I group metals

B. II group metals are more electroposite than I group metals

C. I group elements are denser than II group metals

D. I group elements are smaller than II group elements

Answer: A

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30. Chemical A is used for water softening to remove temporary hardness. A reacts with sodium carbonate to generate caustic soda. When carbondioxide is bubbled through A, it turns cloudy. What is the chemical formula of A?

A. $CaCO_3$

B. CaO

C. $Ca(OH)_2$

D. $Ca(HCO_3)_2$

Answer: C

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ADDITIONAL PRACTICE EXERCISE LEVEL II (LECTURE SHEET) (ADVANCED)

1. Be and / have following resemblance due to diagonal relationship :

A. habe nearly equal electronegatively

B. form amphoteric oxides

C. have same charge / radius ratio

D. both form dimeric halides

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

Watch Video Solution

2. The correct statements is are :

A. $BeCI_2$ is a covalent compound

B. $BeCI_2$ can form diner

C. $BeCI_2$ is an electron deficient molecule

D. The hybrid state of Be in $BeCI_2$ is sp^2

Answer: A::B::C

Watch Video Solution

3. The compounds(s) of alkaline earth metals, which are amphoteric in nature is / are

A. BeO

B. MgO

C. $Be(OH)^2$

D. $Mg(OH)_2$

Answer: A::C

Watch Video Solution

4. In which of the following reactions, MgO is not formed?

A. $Mg + CO_2 \rightarrow$

B. Mg + dil. $HNO_3 \rightarrow$

C. $Mg + NO \rightarrow$

D. $Mg + B_2O_3 \rightarrow$

Answer: A::C::D

Watch Video Solution

5. Gypsum on heating gives :

A. $CaSO_4\frac{1}{2}H_2O$

B. $CaSO_4$

C. $CaO + SO_3$

D. $CaS + O_2$

Answer: A::B

Watch Video Solution

6. A halide of Be(X) sublimes on heating and is a bad conductor of electricity in molten state. From its aqueous solution it is diffucult to obtain anhydrous salt. This halide of berylium (X) is obtained by heating berylium oxide with carbon tetrachloride at 800° C. This halide of berylium forms a complex of the $M_2[BeX_4]$

What is the compound (X)

A. $BeBr_2$

B. BeF_2

C. $BeCI_2$

D. any of these

Answer: C

Watch Video Solution

7. A halide of Be(X) sublimes on heating and is a bad conductor of electricity in molten state. From its aqueous solution it is diffucult to obtain anhydrous salt. This halide of berylium (X) is obtained by heating berylium oxide with carbon tetrachloride at 800° C. This halide of berylium forms a complex of the $M_2[BeX_4]$

What is the compound formed when $BeCI_2$ disolves in water in cold conditions ?

A. $Be(OH)_2$

B. BeO

C. BeO_2

D. $\left[Be(H_2O)_4\right]CI_2$

Answer: D

Watch Video Solution

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

A) Lattice enthalpy B) Hydration enathalpy

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

Compounds of alkalie earth metals are less soluble than alkali metals, due to

A. Their high hydration enthalpy

B. Their high lattice enthalpy

C. Their increased covalent character

D. Their high ionisation enthalpy

Answer: B

Watch Video Solution

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A) Lattice enthalpy B) Hydration enathalpy

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

has greater value, the compound is less soluble. In case hydration enthaply has greater value, the compound is highly soluble is water

Which of the following is more soluble in water

A. $MgSO_4$

B. $CaSO_4$

C. $SrSO_4$

D. $BaSO_4$

Answer: A

Watch Video Solution

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

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BeF_2 is soluble in water while fluorides of other alkalie earth metals are isoluble because of

A. Covalent nature of BeF_2

B. Ionic nature of BeF_2

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

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

Answer: C

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11. Match the following :

List - I Compound (or) element	List - II Use
A) Mg	P) As an antiseptic
B) Gypsum	Q) Toys are made
C) Plaster of paris	R) Flash light photography
D) Hydraulic	S) Impregnating filter paper
	T) Purification of water

Watch Video Solution

12. Match the following :

Match the following

List - I (Reactants)	List - II (Products)
A) $CaSO_4.2H_2O \xrightarrow{120^\circ C}$	P) Monoclinic dihydrate
B) $CaSO_4.2H_2O \xrightarrow{200^\circ C}$	Q) Orthorhombic dihydrate
C) $Ca(OH)_2 + SiO_2 \rightarrow$	R) Plaster of paris
D) $CaSO_4.\frac{1}{2}H_2O + \frac{3}{2}H_2O \xrightarrow[\text{stage}]{\text{setting}}$	S) Dead burnt gypsum
	T) $CaSiO_3 + H_2O$

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ADDITIONAL PRACTICE EXERCISE PRACTICE SHEET (ADVANCED)

1. Which of the following are soluble in water ?

A. Na_2CO_3

B. BaC_2O_4

C. $MgCO_3$

D. $Ca(NO_3)_2$

Answer: A::D

Watch Video Solution

2. Which of the following salts exist(s) as dechydrated crystal ?

A. Washing sods

B. Glauber.s salt

C. Epsom salt

D. Gypsum

Answer: A::B

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3. Select the incorrect statement(s) :

A. KOH is weaker base than NaOH

B. Mg^{2+} ions are precipitated with theh addition of NH_4OH in the presence of NH_4Cl

C. CaO_2 is less stable than MgO_2

D. Milk of magnesia is an aquesous solution of $Mg(OH)_2$

Answer: A::B::C

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4. Identify the incorrect statement :

A. Li is the hardest element among IA group elements

B. Cs has high melting point among IA group elements

C. The hydration capacity of Ba^{2+} ion is more than Mg^{+2} ion.

D. IIA group elements are harder that IA group elements.

Answer: B::C

Watch Video Solution

5. Which of the following statement(s) is / are correct for anhydrous calcium chloride

A. It is prepared by heating hydrated calcium chloride above 533 K

B. It is used for drying alcohols and ammonia

C. It is used as a dehydrating agent to clear sonw and ice on highways and payments

D. When mixed in concrete it gives quicker initial setting and improves its strenght

Answer: A::C::D

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6. Alkoxides of beryllium $\left[Be(OR)_2\right]_6$ usually have associated strutures with both μ_2 - bridging and terminal OR groups. For example $\left[Be(OCH_3)_2\right]_6$ is a high polymer insoluble in hydrocarbon solvents. On the other hand, tertiary - butoxy derivative is less condensed being only a trimer $\left[Be(O-t-Bu)_2\right]_3$

The C - Be - C angle $\left[Be(CH_3)_2\right]_n$ is

A. Equal to CI - Be - C angle in $\left[Be(CI_2)\right]_n$

B. Less than CI - Be - C angle in $[Be(CI_2)]_n$

C. Greater than the CI - Be - C angle in $[Be(CI_2)]_n$

D. NO reaction to CI - Be - C angle in $[Be(CI_2)]_n$

Answer: B

Watch Video Solution

7. Alkoxides of beryllium $[Be(OR)_2]_6$ usually have associated strutures with both μ_2 - bridging and terminal OR groups. For example $[Be(OCH_3)_2]_6$ is a high polymer insoluble in hydrocarbon solvents. On the other hand, tertiary - butoxy derivative is less condensed being only a trimer $[Be(O-t-Bu)_2]_3$

With bulky alkoxide groups the beryllium compound exists as monomers which have

A. Linear structure with 180° bond angle

B. Trigonal planar structure with 120° bond angle

C. Tetrahedral structure with $190^\circ 28^3$ bond angle

D. Distorted tetrahedral structure with more than $109^\circ 28^1$ in interal C - Be - C bond

Answer: A

Watch Video Solution

8. Alkoxides of beryllium $\left[Be(OR)_2\right]_6$ usually have associated strutures with both μ_2 - bridging and terminal OR

groups. For example $\left[Be(OCH_3)_2\right]_6$ is a high polymer insoluble in hydrocarbon solvents. On the other hand, tertiary - butoxy derivative is less condensed being only a trimer $\left[Be(O-t-Bu)_2\right]_3$

The vapour phase, $BeCI_2$ is

A. two coordinate with lienar structure

B. three coordinate with planar triangular structure

C. four coordinate with regular tetrahedral structure

D. four coordinate with irregular tetrahedral polymeric structure

Answer: B

Watch Video Solution

9. Solubility depends on the lattice energy of the solid and the hydration energy of the ions. Some lattice values for Group - II compounds are much lighter than the values for Group - I compounds, because of the effect of the increased charge on the ions in the Boron - Lande equation. Taking any one particular negative ion the lattice energy decreases as the size of the metal increases. The hydration energy also decreases as the metal ions become larger. For a substance to dissolve, the hydration energy must exceed thelattice energy

The correct order of solubility is

A. $BeF_2 < CaF_2 > SrF_2 > BaF_2$

B. $BeF_2 > CaF_2 < SrF_2 < BaF_2$

C. $CaF_2 < SrF_2 < BaF_2 < BeF_2$

D. $CaF_2 > SrF_2 > BaF_2 > BeF_2$`

Answer: C

Watch Video Solution

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The correct order of hydration energies is

A. $Be^{2+} < Ca^{2+} < Cr^{2+} < Ba^{2+}$

B. $Be^{2+} < Sr^{2+} < Ca^{2+} < Ba^{2+}$

C. $Be^{2+} > Sr^{2+} > Ca^{2+} > Ba^{2+}$

D. $Be^{2+} > Ca^{2+} > Sr^{2+} > Ba^{2+}$

Answer: D

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11. Match the following columns

Column - I	Column - II
A) CaO	P) Refractory Material
B) $CaCl_2$	Q) Drying agent
C) MgO	R) Sorrell's cement
D) $MgCl_2$	S) Antacid

Watch Video Solution

12. Match the following columns

Column - I	Column - II
A) $BeCl_2$ (solid)	P) Polymeric
B) BeH_2 (solid)	Q) sp^3 hybridization
C) BeO (solid)	R) Amphoteric
D) MgO (solid)	S) Refractory material

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ADDITIONAL PRACTICE EXERCISE ADDITIONAL QUESTIONS

1. Beryllium shows diagonal relationship with aluminium. Which one of the following similarity is not correct?

A. Be_2C like AIC_3 yields methane on hydrolysis

B. Be like AI is rendered passive by HNO_3

C. Be $(OH)_2$ like $AI(OH)_3$ is basic

D. Be forms beryllates and Al forms aluminates

Answer: C

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2. The solubility of sulphates of alkaline earth metals in water shows the order

A. $Be > Ca > Mg > Ba > Sr$

B. $Mg > Be > Ba > Ca > Sr$

C. $Be > Mg > Ca > Sr > Ba$

D. $Mg > Ca > Ba > Be > Sr$

Answer: C

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3. The following compounds have been arranged in order of their increasing thermal stabilities. Ideentify the correct order

A. $I < II < III < IV$

B. $IV < II < III < I$

C. $Iv < II < Illl$

D. $II < IV < III < I$

Answer: B

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4. A metal M readily forms its sulphate MSO_4 which is water soluble. It forms oxide Mo which becomes inert on heating. It forms insouble hydroxide which is soluble NaOH. The metal is

A. Mg

B. Ba

C. Ca

D. Be

Answer: D

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5. In curing cement plasters, water is sprinkled from time to time. Which of the following statements are incorrect.

A. hydrating sand and gravel mixed with cement

B. converting sand into silicate

C. developing interlocking needle like crystals of hydrated silicates

D. keeping it cool because setting of cement is an exothermic process

Answer: D

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6. Several blocks of magnesium are fixed into the bottom of ship to :

A. prevent action of water and slat

B. prevent puncturing by under sea rocks

C. keep away the sharks

D. make the ship lighter

Answer: D

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7. The solubilities of carbonates decreases down ther magnesium group due to decrease in

A. inter ionic attraction

B. entropy of solution formatino

C. lattice energy of solids

D. hydration energy of cations

Answer: D

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8. The substance not likely to contain $CaCO_3$ is

A. sea shells

B. dolomite

C. a marble statue

D. calcined gypsum

Answer: D

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

A. two mole of HNO_3

B. two mole of NH_3

C. I mole of NH_3

D. 1 mole of HNO_3

Answer: B

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10. A sodium salt on treatment with $MgCI_2$ gives white precipitate only on heating. The anion of sodium salt is

A. HCO_3^-

B. CO_3^{2-}

C. NO_3^-

D. SO_4^{2-}

Answer: A

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11. $\left[Be(H_2O)_4\right]CI_2$ on heating gives

A. O_2

B. Be

C. $BeCI_2$

D. $\left[Be(OH)_4\right]^{2-}$

Answer: D

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12. Calcium cyanamide on hydrolysis gives a gas B which on oxidation with bleaching powder gives another gas C. When magnesium is heated in gas C and the resultant compound D on adding to water gives the same gas B. Then B,C and D are

A. NH_3, N_2, Mg_3N_2

B. $N_2, NH_3, MgNH$

C. $NH_3, No, Mg(NO_3)_2$

D. $NH_3, NO, Mg(NO_3)_2$

Answer: A

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13. Alkaline earth metals form halides of the type MX_2 Which is false about them ?

A. They can be prepared by the direct reaction of metal and halogens

B. bertyllium halides are covalent while the halides of other elements are ionic

C. Beryllium halides are covalent from BeX_2 to BaX_2

D. except BeF_2 the solubility of other halides increases from $BeX_2 \text{to} BaX_2$

Answer: D

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14. A metal salt solution forms a yellow/precipitate with K_2CrO_4 in acetic a while precipitate with dil H_2SO_4 but gives no preciptate with NaCI or Nal. The white precipitate obtained when Na_2CO_3

A. $CaCO_3$

B. $SrCO_3$

C. $BaCO_3$

D. Basic magnesium carbonate

Answer: C

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15. $BeCI_2 + N_2O_4 \rightarrow A \xrightarrow[\text{Vacuumn}]{50^\circ C} B \xrightarrow{125^\circ C} C$. The compounds

A. B and C are

A. $BeO.\ Be(NO_2)_2.\ Be(NO_3)_2$

B. $BeO,\ Be(NO_3)_2,\ Be(NO_2)_2$

C. $Be(NO_3)_2,\ 2N_2O_4,\ Be(NO_3)_2,\ \left(Be(NO_2)_2\right.$

D. $Be(NO_3)_2.2N_2O_4.\ Be(NO_3)_2\left[Be_4O(NO_3)_6\right]$

Answer: D

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