



CHEMISTRY

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

S-BLOCK ELEMENTS

Exercise 1

1. Which of the following does not illustrate the anomalous properties of lithium?

- A. Li is much softer than the other group I metals
- B. the melting point and boiling point of Li are comparatively high
- C. Li forms a nitride Li_3N unlike group I metals
- D. the ion of Li and its compounds are more heavily hydrated than those of the rest of the group elements

Answer: A



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2. The alkali metals have low melting point. Which of the following alkali metal is expected to melt if the room temperature rises to $30^{\circ}C$?

A. Na

B. K

C. Rb

D. Cs

Answer: D



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3. A solid is a compound of group I element and it gives a bright red colour in the flame test. The solid is

A. LiBr

B. CaCl

C. KCl

D. NaCl

Answer: A



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4. Choose the correct option from the codes given below regarding elements and their characteristics colour given in column I and column II respectively of the following table.

Column I	Column II
A. <i>Li</i>	1. Crimson red
B. <i>Na</i>	2. Yellow
C. <i>K</i>	3. Red violet
D. <i>Rb</i>	Blue violet

A.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
2	1	3	5

B.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
1	2	4	3

C.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
1	2	5	3

D.

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
1	2	3	4

Answer: C



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5. Amongst $LiCl$, $RbCl$, $BeCl_2$ and $MgCl_2$, the compounds with the greatest and the least ionic character respectively are :

- A. $RbCl$ and $LiCl$
- B. $MgCl_2$ and $RbCl$
- C. $BeCl_2$ and $RbCl$
- D. $BeCl_2$ and $LiCl$

Answer: C



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

A. magnesium nitrate

B. calcium nitrate

C. barium nitrate

D. strontium nitrate

Answer: B



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7. Mix calcium sulphate with conc. HCl and forms a paste. Bring a pinch of this paste near to the flame, what colour will you obtain?

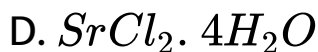
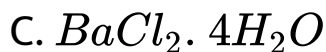
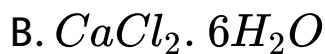
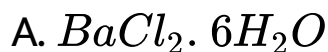
- A. Brick red
- B. Apple green
- C. Golden yellow
- D. Crimson red

Answer: A



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8. Identify the correct formula for halides of alkaline earth metals.

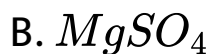


Answer: B



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9. In aqueous solution the most stable sulphate is

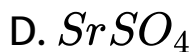
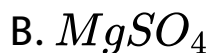


Answer: D



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10. In which of the following is the hydration energy higher than the lattice energy?



Answer: B



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11. Lattice energy (numerical value) of chloride of alkali metals is in order of



Answer: A



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12. Correct order of decreasing covalent character in metal halides is

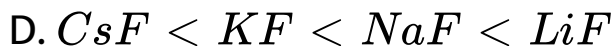
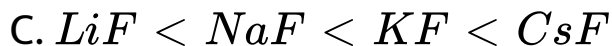
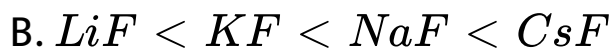


Answer: A



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13. The correct order of solubility of alkali metal fluorides in water is



Answer: C



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14. The compound which librate(s) a mixture of NO_2 and O_2 on heating is

A. $LiOH$

B. $NaOH$

C. $LiNO_3$

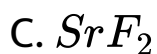
D. Li_2CO_3

Answer: C



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15. The most soluble fluoride in water is

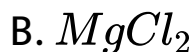


Answer: A



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16. Some of the Group 2 metal halides are covalent and soluble in organic solvents. Among the following metal halides, the one which is soluble in ethanol is



Answer: A



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17. When sodium is dissolved in liquid ammonia, a solution of deep blue colour is obtained. The colour of the solution is due to

- A. the presence of ammoniated electron
- B. the presence of sodium ions
- C. the formation of sodium hydride
- D. the formation of $NaNH_2$

Answer: A



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18. When washing soda is heated.

- A. CO_2 is released
- B. $CO + CO_2$ is released
- C. CO is released
- D. water vapour is released

Answer: D



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19. In the synthesis of sodium carbonate, the recovery of ammonia is done by treating NH_4Cl

with $Ca(OH)_2$. The by-product obtained in this process is

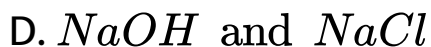
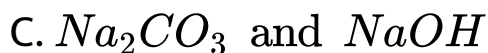
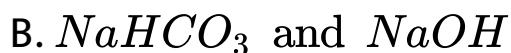


Answer: A



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20. The pair of compounds which cannot exist in solution is:



Answer: B

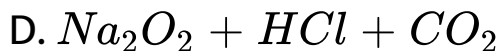
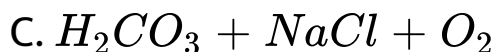
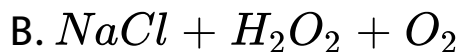


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21.



The products in the above reaction are respectively

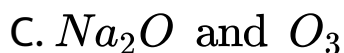
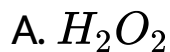


Answer: A



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22. Sodium peroxide, a yellow solid, when exposed to air becomes white due to the formation of



Answer: D



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23. On reacting with NaOH, which gives inflammable gas?

A. Zn

B. S

C. I_2

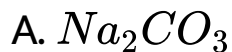
D. NH_4Cl

Answer: A



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24. Which of the following compounds of sodium is the most basic ?



D. All are equally basic

Answer: C



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25. In the manufacture of NaOH by the electrolysis of NaCl solution, the cathode and anode are separated using a diaphragm because

- A. it prevents the reaction between H_2 and Cl_2 formed
- B. it prevent the mixing of NaOH and NaCl
- C. it prevents the reaction between Na and Cl_2
- D. it increases the yield of NaOH

Answer: A



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26. NaOH is not used in

A. paper industry

B. soap industry

C. rayon industry

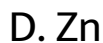
D. plastic industry

Answer: B



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27. Hydrogen gas is liberated in the reaction of sodium hydroxide with



Answer: A



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28. Baking powder contains:

A. $NaHCO_3$, $Ca(H_2PO_4)_2$ and starch

B. $NaHCO_3$, $Ca(H_2PO_2)_2$

C. $NaHCO_3$, Starch

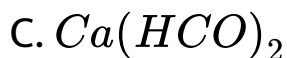
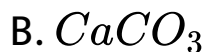
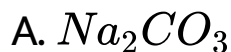
D. $NaHCO_3$

Answer: A



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29. A colourless solid (X) on heating evolved CO_2 and also gave a white residue, soluble in water. Residue also gave CO_2 when treated with silute acid. (X) is



Answer: D



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30. Match the terms of column I with column II and choose the correct option from the codes given below.

Column I

A. Sodium hydroxide

B. Sodium chloride

C. Sodium bicarbonate

D. Sodium carbonate

Column II

1. Baking soda

2. Brine solution

3. Washing soda

4. Caustic soda

A. *A B C D*
4 2 1 3

B. *A B C D*
4 3 2 1

C. *A B C D*
1 2 3 4

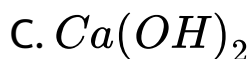
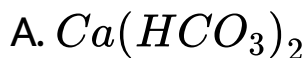
D. *A B C D*
3 2 4 1

Answer: A



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31. A chemical A is used for the preparation of washing soda to recover ammonia. When CO_2 is bubbled through an aqueous solution of A, the solution turns milky. It is used in white washing due to disinfectant nature what is the chemical formula of A?



D. CaCO_3

Answer: C



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32. Choose the correct statement(s).

A. Calcium oxide is commonly known as quick lime

B. Calcium oxide when heated in oxyhydrogen flame, it emits lime light

C. Calcium oxide on reaction with water gives
soda lime

D. Both (a) and (b) statements are correct

Answer: D

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33. Select the correct statement(s) about CaO .

A. its aqueous solution can absorb CO_2

B. it is used as refractory

C. It can remove temporary hardness

D. All of the above are correct statements

Answer: D



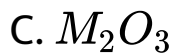
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Exercise 2

1. The electronic configuration of metal M is $1s^2 2s^2 2p^6 3s^1$. The formula of its oxide will be :

A. M O

B. M_2O



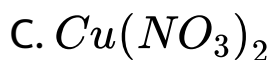
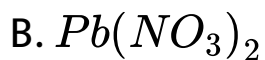
Answer: B



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2. Nitrogen dioxide cannot be prepared by heating

:



D. $AgNO_3$ '

Answer: A



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3. The reducing power of a metal depends on various factors. Suggest the factor which makes Li, the strongest reducing agent in aqueous solution.

A. Sublimation enthalpy

B. Ionisation enthalpy

C. Hydration enthalpy

D. Electron gain enthalpy

Answer: C



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4. When $NaOH$ is made, the gas released at the cathode is

A. Cl_2

B. H_2

C. O_2

D. H_2O

Answer: B



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5. Identify the correct statement.

- A. Elemental sodium can be prepared and isolated by electrolysis of an aqueous solution of NaCl
- B. Elemental Na is a strong oxidising agent
- C. Elemental Na is insoluble in NH_3
- D. Elemental Na is easily oxidised

Answer: D



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6. On dissolving moderate amount of sodium metal in liquid ammonia at low temperature, which of the following does not occur ?

A. Blue coloured solution is obtained

B. Na^+ ions are formed in the solution

C. Liquid NH_3 solution becomes good conductor of electricity

D. Liquid NH_3 solution remains diamagnetic

Answer: D



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7. A combustible gas is liberated when caustic soda solution is heated with

A. S

B. NH_4Cl

C. I_2

D. Zn

Answer: D



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8. A mixture contains two moles of Na_2CO_3 and 1 mole of Li_2CO_3 . What will be the volume of CO_2 formed on heating this mixture and the data is converted to STP?

A. 22.4 L

B. 44.8 L

C. 50.2 L

D. 11.2 L

Answer: A



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9. Element A burns in nitrogen to give an ionic compound B. Compound B reacts with water to give C and D. The solution of C becomes milky on bubbling carbon dioxide . The element A is

A. Li

B. Mg

C. Ca

D. Be

Answer: C



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10. Sodium is heating in air at $350^{\circ}C$ to form A. compound A when reacts with carbon dioxide forms sodium carbonate and Y. Here, Y is

A. hydrogen peroxide

B. hydrogen

C. ozone

D. oxygen

Answer: D



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11. A colourless salt X has 50% Na_2SO_3 and 50% H_2O . How much of SO_2 at NTP is obtained when 2.52 g of X reacts with excess of dil. H_2SO_4 ?

A. 22.4 L

B. 0.448 L

C. 44.8 L

D. 0.224 L

Answer: D



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



Answer: A



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13. A more economical process but based on same principle was given by

A. Solvay

B. Leblanc

C. Williamson

D. Haber

Answer: A



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14. Reaction given in passage is spontaneous because

A. NaOH formed is ionic

B. $CaCO_3$ is removed from the reaction mixture

C. reaction is exothermic

D. reaction is endothermic

Answer: B



15. NaOH can also be prepared by electrolysis of aqueous NaCl. Amount of NaOH formed when 0.445 L of NaCl (aq) is electrolysed for 137s with a current of 1.08 A, is

A. 0.09 g

B. 0.12 g

C. 0.06 g

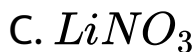
D. amount of NaCl has not been given

Answer: C



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16. Which of the following compound is used in gun powder ?



D. None of these

Answer: B



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17. Solubility of alkaline earth metal sulphates decreases down the group 2 because

A. they become more ionic

B. lattice energy of sulphates does not vary significantly

C. hydration energy decrease rapidly from Be^{2+} to Ba^{2+}

D. lattice energy plays more predominant role than hydration energy.

Answer: C



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

- A. magnesium nitrate
- B. calcium nitrate
- C. calcium nitrate
- D. strontium nitrate

Answer: B



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19. A metal M readily forms its sulphate MSO_4 which is water soluble. It forms oxide MO which becomes inert on heating. It forms insoluble hydroxide which is soluble in $NaOH$. The metal M is:

A. Be

B. Mg

C. Ca

D. Sr

Answer: A



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20. Beryllium and aluminium exhibit many properties which are similar . But, the two elements differ in

- A. exhibiting maximum covalency in compounds
- B. forming polymeric hydrides
- C. forming covalent halides

D. exhibiting amphoteric nature in their oxides

Answer: A



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