PREVIOUS HSE QUESTIONS FROM THE CHAPTER "S-BLOCK ELEMENTS"

1. Name the commercial process used to prepare sodium carbonate and write the chemical equations of the steps involved in it. (4) [August 2018]
2. Account for the following :
   a) Blue coloured solutions are obtained when alkali metals are dissolved in liquid ammonia.
   b) ' Li' and 'Mg' show similar properties.
   c) Aqueous solution of Na_2CO_3 is alkaline.
   d) $BeSO_4$ and $MgSO_4$ are readily soluble in water. (4 x 1 = 4) [March 2018]
3. Lithium and Magnesium show diagonal relationship.
   a) Give any two similarities between Li and Mg. (2)
   b) What happens when Na is treated with i) water and ii) NH_3? [July 2017]
4. The s-block elements of periodic table constitute alkali metals and alkaline earth metals.
   a) The hydroxides and carbonates of sodium and potassium are more soluble than that of corresponding salts of magnesium and calcium. Explain. (2)
   b) Write the chemical name of the following:
      i) Caustic soda ii) Baking soda iii) Slaked lime iv) Milk of lime (2) [March 2017]
5. a) Match the following:

A	B
i) Caustic soda	1) Antacid
ii) Sodium carbonate	2) Mild antiseptic
iii) Magnesium hydroxide	3) Castner kellner cell
iv) Sodium bicarbonate	4) Solvay process

   b) Cement is an important building material. Explain the manufacture of cement. (4) [September 2016]
6. a) Alkali metals dissolve in liquid ammonia to give blue coloured solutions. Why? (2)
   b) Plaster of Paris is an important compound of calcium.
      i) Give the chemical formula of plaster of Paris. (1)
      ii) Identify the property of plaster of Paris which helps in plastering of broken bones. (1) [March 2016]
7. Alkali metals are highly reactive due to their low ionization enthalpies.
   a) The alkali metal which acts as the strongest reducing agent in aqueous solution is …… (1)
   b) How is sodium carbonate prepared using Solvay process? Is this method suitable for the preparation of potassium carbonate? Justify. (3) [October 2015]
8. a) The metal present in the chlorophyll of plants is ……. (1)
   b) Give any two uses of caustic soda. (1)
   c) When sodium metal dissolves in liquid ammonia, it gives a deep blue coloured solution. Explain the reason. (2) [March 2015]
9. a) The reactivity of alkali metals towards air is different for different metals. How do alkali metals react with air? (2)
   b) Match the following: (2)

A	B
1) sodium hydroxide	a) Dead burnt plaster
2) Anhydrous calcium sulphate	b) Slaked lime
3) Calcium hydroxide	c) Quick lime

4) Sodium bicarbonate	d) Caustic soda
	e) Baking soda

[August 2014]

10. a) Give reasons.
    i) KO_2 is paramagnetic. (1)
    ii) Solutions of alkali metals in liquid ammonia are blue in colour. (1)
    b) Match the following: (2)

A	B
Quick lime	$Ca(OCl)_2$
Plaster of paris	CaO
Bleaching powder	$Ca(OH)_2$
Slaked lime	$CaSO_4.\ ½\ H_2O$
	$CaCl_2$
	$CaCO_3$

(March 2014)

11. a) Fill in the blanks:
    i) The suspension of a magnesium compound in water is used as an antacid. The compound is …… (1)
    ii) A mixture of calcium oxide (Quick lime) and caustic soda (NaOH) is called ……. (1)
    b) When CO_2 is passed through lime water it turns milky. On passing excess of CO_2, the milky colour disappears. Give the chemical reactions involved in these processes. (2) [September 2013]
12. Alkali metals and alkaline earth metals belong to the s-block of the periodic table.
    a) Name the process used for the industrial preparation of sodium carbonate. (1)
    b) The above method is not suitable for the preparation of potassium carbonate. Give the reason. (1)
    c) Draw the chain structure of beryllium chloride in solid state. (1)
    d) Write the chemical equation showing the preparation of Plaster of Paris from gypsum. (1) [March 2013]
13. a) Lithium and Magnesium belong to 1st and 2nd groups in the periodic table. They resemble each other in many respects.
    i) Name such relationship. (1)
    ii) Give one similarity between Li and Mg. (1)
    b) A compound of calcium is used in hospitals for setting fracture of bones.
    i) Write the name and formula of the above compound. (1)
    ii) What is dead burnt plaster? (1) [September 2012]
14. Beryllium shows diagonal relationship with aluminium.
    a) Mention any two similarities between beryllium and aluminium. (2)
    b) Match the following: (2) [March 2012]

A	B
Sodium carbonate	Chain structure in the solid state
Beryllium chloride	Mild antiseptic
Sodium hydroxide	Solvay process
Sodium hydrogen carbonate	Castner-Kellner cell

15. Match the following:

A	B	C
a) Gypsum	1) Magnesium	i) Solvay process
b) Milk of magnesia	2) Magnesium hydroxide	ii) Nerve signal transmission
c) Washing soda	3) Sodium	iii) Cement
d) Alkali metal	4) Calcium sulphate	iv) Antacid
	5) Sodium carbonate	v) Violet flame

(4) [October 2011]

16. Monovalent Na^+, K^+ ions and divalent Ca^{2+}, Mg^{2+} ions are found in large proportions in biological fluids.
    a) In which part of our body are sodium and potassium ions permanently located? (1)
    b) What are the major roles of these Na^+ and K^+ ions in our body? (1)
    c) For making which part of our body is calcium mainly used? (1)
    d) Give the name of the metal present in chlorophyll. (1) [March 2011]
17. I) State whether the following sentences are true or false:
    a) Metals in the 2nd group are called alkali metals.
    b) Alkali metals are not found in free state in nature.
    c) Baking soda is chemically sodium hydrogen carbonate.
    d) Portland cement is basically silicates and aluminates of calcium. (2)

    II) Fill in the blanks:
    a) Molecular formula of Plaster of Paris is ……
    b) Beryllium shows diagonal relationship with ……..
    c) The metal present in chlorophyll is ……
    d) Solvay process is associated with the preparation of …….. (2) `[September 2010]
18. The group 1 metals of the periodic table of elements are collectively called alkali metals.
    a) Write the general electronic configuration of alkali metals. (1)
    b) Identify the alkali metal exhibiting anomalous properties. Explain (1)
    c) Alkali metals are normally kept in kerosene. Why? (1)
    d) Alkali metals are never found free in nature. Give reason. (1) [March 2010]
19. a) How will you prepare $Ca(OH)_2$ and $CaCO_3$ from quick lime (CaO)? (2)
    b) Complete the following reactions:
    i) $CaCO_3 \xrightarrow{1200K}$?
    ii) $CaCO_3 + H_2SO_4 \longrightarrow$? (2) [March 2009]
20. When CO_2 is passed through lime water it turns milky.
    a) What is the reaction in the above case? (1)
    b) What happens when more CO_2 is passed to the milky solution? Why? (2) [June 2008]
21. Lithium of the 1st group resembles Magnesium of 2nd group in the periodic table.
    i) What is the name of this relationship? (1)
    ii) What is the reason for it? (1)
22. List any two similarities between Li and Mg. (1) [February 2008]

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