CHEMISTRY

BOOKS - VIKRAM PUBLICATION (ANDHRA PUBLICATION)

THE S-BLOCK ELEMENTS

Solved Problems

1. What is the oxidation state of K in KO_2 ?

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2. The $E^{\ominus}$ for Cl_2 / Cl^- is + 1.36, for I_2 / I^- is + 0.53, for Ag^+ / Ag is + 0.79, Na^+ / Na is -2.71 and for $Li^+ / Liis - 0.35$. Arrange the following ionic species in decreasing order of reducing strength :

I^-, Ag, Cl^-, Li, Na

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3. Why is KO_2 paramagnetic?

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

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

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Very Short Answer Questions

1. Give reasons for the diagonal relationship observed in the periodic table .

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2. Write completely the electronic configurations of K and Rb.

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3. Lithium salts are mostly hydrated . Why ?

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4. Which of the alkali matals shows abnormal density ? What is the order of the variation of density amoung the IA group elements ?

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5. Lithium react with water less vigorously than sodium. Give your reason.

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6. Lithium lodide is the most covalent among the alkali metal halides . Give the reason.

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7. In what respects lithium hydrogen carbonate differs from other alkali metal hydrogen carbonates?

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8. Write the complete electronic configuretion of any two alkaline metals .

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9. Tell about the variation of m. pts., and b.pts among the alkaline eart metals .

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10. What are the characteristic colours imparted by the II A elements?

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11. What happens when magnesium metal is burnt in air?

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12. Lithium carbonate is not so stable to heat as the other alkali metal carbonates. Explain.

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13. Write a balanced equation for the formation of ammoniated IIA metal ions form the metals in liquid ammonia?

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

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15. What happens when hydrated $Mg(NO_3)_2$ is heated? Give the balanced equation.

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

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

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18. Write the average composition of Portland cement.

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19. Why is gypsum added to cement?

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20. Why are alkali metals not found in the free state in nature?

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21. Potassium carbonate cannot be prepared by Solvey process. Why?

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22. Describe the important uses of caustic soda.

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23. Describe the important uses of sodium carbonate.

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24. Describe the important uses of quick lime.

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

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26. Describe the importance of Plaster of Paris.

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27. Which of the alkaline earth metal carbonate is thermally the most stable? Why?

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28. Write balanced equations for the reaction between (i) Na_2O_2 and water (ii) K_2O and water.

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Short Answer Questions

1. Alkali metals and their salts impart characteristic colours to an oxidizing flame. Explain the reason.

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2. What makes caesium and potassium useful as electrodes in photoelectric cells?

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3. Write a short note on the reactivity of alkali metals towards air.

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4. Give any two uses for each of the following metals. (i) Lithium (ii) Sodium.

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5. Give an account of the properties of washing soda.

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6. Mention some uses of sodium carbonate.

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7. How do you obtain pure sodium chloride from a crude sample?

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8. What do you know about Castner-Kellner process? Write the principle involved in it.

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9. Write a few applications of caustic soda.

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10. Give an account of the biological importance of Na^+ and K^+ ions.

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11. Mention the important uses of Mg metals.

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12. Show that $Be(OH)_2$ is amphoteric in nature.

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

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14. Be shows diagonal relationship with Al. Disicuss.

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15. What is Plaster of Paris? Write a short note on it.

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16. In what ways lithium shows similarities to magnesium in its chemical behavior?

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17. 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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18. What happens when (i) Sodium metal is dropped in water (ii) Sodium metal is heated in a free supply of air? Iii) Sodium peroxide dissolves in water?

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19. State as to why

(i) An aqueous solution of Na_2CO_3 is alkaline.

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20. How would you expalain the following observation?

(i)BeO is almost insoluble but `BeSO

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Long Answer Questions

1. Justify the inclusion of alkali metals in the same group of the periodic table with reference to the following.

(i) Electronic configuration.

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2. Write an essay on the differences between lithium and other alkali metals.

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3. Discuss the preparation and properties of sodium carbonate.

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4. Discuss the similarities between alkaline earth metals and gradation in the following aspects: (i) Electronic configuration.

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5. Discuss on : (i) Carbonates.

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6. What are the common physical and chemical features of alkali metals?

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

metals.

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8. Discuss the various reactions that occur in the Solvay process.

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9. Starting with sodium chloride how would you proceed to prepare

(1) Sodium metal.

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10. What happens when (i) magnesium is burnt in air (ii) quick lime is heated with silica (iii) chlorine reacts with slaked lime (iv) calcium nitrate is heated ?

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11. Explain the significance of sodium , potassium, magnesium and calcium in

biological fluids.

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12. Write a few lines about cement.

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