



CHEMISTRY

NCERT - NCERT CHEMISTRY(ENGLISH)

THE S-BLOCK ELEMENTS

Solved Example

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^+/Li is -3.04 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 solubility of alkaline earth metal hydroxides increases from $Be(OH)_2$ to $Ba(OH)_2$?



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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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Exercise

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



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



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3. Why are alkali metals not found in nature?



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4. Find out the oxidation state of sodium in Na_2O_2 .



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5. Explain why is sodium less reactive than potassium.



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6. Compare the alkali metals and alkaline earth metals with respect to (a) ionisation enthalpy, (b) basicity of oxides and (c) solubility of hydroxides.



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7. In what ways lithium shows similarities to magnesium in its chemical behaviour?





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8. Explain why can alkali and alkaline earth metals not be obtained by chemical reduction methods?



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9. Why are potassium and caesium, rather than lithium used in photoelectric cells?



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10. 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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11. Beryllium and magnesium do not give colour to flame whereas other alkaline earth metals do so. Why?



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



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13. Why potassium carbonate (K_2CO_3) cannot be prepared by Solvay-ammonia process ?



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14. Why is Li_2CO_3 decomposed at a lower temperature whereas Na_2CO_3 at higher temperature?



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15. Compare the solubility and thermal stability of the following compounds of the alkali metals with those of the alkaline earth metals. (a) Nitrates (b) Carbonates (c) Sulphates.



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16. Starting with sodium chloride how would you proceed to prepare:

- (a) sodium metal
- (b) sodium hydroxide
- (c) sodium peroxide



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17. What happens when (a) magnesium is burnt in air, (b) quicklime is heated with silica,

(c) chlorine reacts with slaked lime and (d) calcium nitrate is heated?



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18. Describe two important uses of each of the following:

(a) caustic soda, (b) sodium carbonate and (c) quicklime.



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19. Draw the structure of (a) $BeCl_2$ (vapour) and (b) $BeCl_2$ (solid).



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20. The hydroxides and carbonates of sodium and potassium are easily soluble in water while the corresponding salts of magnesium and calcium are sparingly soluble in water. Explain.



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21. Describe the importance of the following:

(a) limestone, (b) cement and (c) plaster of Paris.



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22. Why are lithium salts commonly hydrated and those of the other alkali ions usually anhydrous?



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23. Why is LiF almost insoluble in water whereas $LiCl$ soluble not only in water but also in acetone?



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24. Explain the significance of sodium, potassium, magnesium and calcium on biological fluids.



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25. What happens when

- a. Sodium metal is dropped in water?
- b. Sodium metal is heated in free supply of air?
- c. Sodium peroxide dissolves in water?



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26. Comment on each of the following observation:

- a. The mobilities of the alkali metal ions in aqueous solution are



b. Lithium is the only alkali metal to form a nitride directly.

c. E^\ominus for $M_{aq}^{2+} + 2e^- \rightarrow M_{(s)}$ (where M=Ca, Sr or Ba) is nearly constant.



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27. State as to why

(a) a solution of Na_2CO_3 is alkaline ?

(b) alkali metals are prepared by electrolysis of their fused chlorides?

(c) sodium is found to be more useful than potassium ?



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28. Write balanced equations for reactions between

a. Na_2O_2 and water

b. KO_2 and water

c. Na_2O and CO_2



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29. How would you explain the following observations ?

(i) BeO is almost insoluble but BeSO_4 is soluble in water

(ii) BaO is soluble but BaSO_4 is insoluble in water

(iii) LiI is more soluble than KI in ethanol



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30. Which of the alkali metal is having least melting point?

A. Na

B. K

C. Rb

D. Cs

Answer:



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31. Which one of the following alkali metals gives hydrated salts?

A. Li

B. Na

C. K

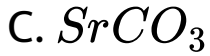
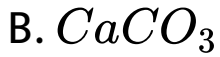
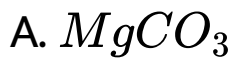
D. Cs

Answer:



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32. Which one of the alkaline earth metal carbonates is thermally the most stable?



Answer:



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