

10.2 ALKALI METALS

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Periodic discussion and general characteristics

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| 1. Write short notes on the characteristics of alkali metals. | 5 |
| 2. Give the characteristics of alkali metals. | 5 |
| 3. Alkali metals impart a characteristic colour to the flame. Give reason. | |
| 4. Sodium metal burns in air, giving a golden yellow flame. Why? | 2 |

Sodium

Extraction from Down's process

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| 5. Why cannot alkali metals be obtained by the chemical reduction method? | |
| 6. Give reason: The carbon reduction process does not apply to the extraction of alkali metals. | 1 |
| 7. Why is the carbon reduction process not applied for the extraction of alkali metals? Name any suitable method for the extraction of these metals. 1+1 | |
| 8. Why is a mixture of CaCl_2 and KF added to NaCl during the extraction of sodium? | 2 |
| 9. How is sodium extracted by Down's process? Sketch a diagram of Downs' cell and write the reaction involved. What are the difficulties in obtaining sodium by this process, and how are they removed? | 7 |
| 10. Sketch a well-labelled diagram for the manufacture of sodium by Down's process. What are the advantages of this process? | 6 |
| 11. Describe the extraction of sodium by Down's process. | 6 |
| 12. How is sodium extracted from Down's process? | 5 |
| 13. Write the principle and process along with a self-explanatory diagram for the manufacture of sodium by Down's process. | 6 |
| 14. Explain the chemistry of Down's process for the extraction of sodium. | |
| 15. Write the principle involved in the extraction of sodium from sodium chloride and also draw a self-explanatory diagram for Down's process of the extraction of sodium. | 5 |
| 16. How is sodium extracted from sodium chloride using Down's electrolytic cell? | 5 |
| 17. Sketch a well-labelled diagram for the extraction of sodium by Down's process and explain the principle involved in the process. | 6 |

Chemical properties

Action with air

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| 18. What happens when a piece of sodium metal is exposed to air? | 2 |
| 19. What happens when sodium is exposed to moist air? | 1 |
| 20. How does sodium react with moist air? | 1.5 |
| 21. Give reason: Sodium metal gets tarnished in the air. | 1 |
| 22. Why is sodium metal kept in kerosene? | 1 |
| 23. Convert sodium into washing soda. | 1 |
| 24. Starting from Sodium, how would you prepare $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$? | |

Action with water

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| 25. What happens when a piece of sodium metal is dropped into water? | 2 |
| 26. Write the action of sodium with H_2O . | 2 |
| 27. Why is the sodium fire in the laboratory not extinguished by adding water? | |
| 28. Why is a sodium fire not extinguished by adding water? | 1 |

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| 29. What is the main product obtained when sodium is allowed to react with dry ammonia at 300°C – 400°C? | 2 |
| 30. What happens when sodium is heated with NH ₃ ? | 1 |
| 31. What happens when sodium is treated with ammonia? | 1 |
| 32. Write the action of Sodium with NH ₃ . | 2 |
| 33. How does sodium react with NH ₃ ? | 1.5 |

Sodium Hydroxide

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| 34. Give the uses of Sodium hydroxide. | 2 |
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Sodium carbonate (Na₂CO₃)

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| 35. Give any two uses of sodium carbonate. | 1 |
| 36. Give two major uses of Washing soda. | 1 |
| 37. Write the molecular formula of baking soda and Soda ash. | 1 |
| 38. What is the chemical formula of caustic soda, washing soda and baking soda? What are their main uses? | 2 |
| 39. Write the chemical formulae of washing soda and baking soda. What are their uses? | 2 |

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