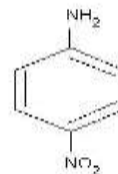


CLASS XI SAMPLE PAPER CHEMISTRY

- Explain why o-nitrophenol has a lower boiling point than p-nitrophenol?
- Why alkali metals used in photoelectric cells?
- Due to which compound, ozone depletion is caused in Antarctica?
- Which of the element among B, Al, C and Si :-
 - Has the highest first ionization enthalpy?
 - Has the most negative electron gain enthalpy?
- Write the atomic number of the element present in the third period and seventeenth group of the periodic table.
 - Out of the elements Cr (Z=24), Mg (Z=12), and Fe (Z=26), identify the element with five electrons in 3d sub shell.
- Critical temperature of ammonia and carbon dioxide are 405.5 K and 304.10 K respectively. Which these gases will liquefy first when you start cooling from 500K to their critical temperature
- An element 'A' belongs to group 2 of the periodic table. It shows anomalous behavior from the rest of the elements of its group. It shows a diagonal relationship with another element 'B'. Chlorides of both 'A' and 'B' have bridged structure in vapour phase. Identify A and B and draw the structures of their respective chlorides.
- Calculate the mass percent of different elements in sodium sulphate (Na₂SO₄).
- Why does the rain water normally have a pH of about 5.6? When does it become acid rain?
- The threshold frequency for the ejection of electron from a metal is $5 \times 10^{14} \text{ s}^{-1}$. Will the photon of radiation having energy $3.0 \times 10^{-19} \text{ J}$ give photo electric effect or not?
- A metal 'X' is present in chlorophyll. Identify the metal 'X'. write the reaction of this metal with N₂.
- An orbital has n=3. What are the possible values of l and m_l?
- Explain the hybridization of PCl₅ molecule. Why PCl₅ on decomposition gives PCl₃ and Cl₂ ?
- Consider the chemical reaction:

$$2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g}) + 189.4 \text{ KJ}$$
 Indicate the direction in which the equilibrium will shift when:-
 - Temperature is increased.
 - Pressure is increased.
 - Concentration of SO₂ is increased.
- Write the IUPAC names of the following compound:-
- For the reaction $\text{NH}_4\text{Cl}(\text{s}) \rightleftharpoons \text{NH}_3(\text{g}) + \text{HCl}(\text{g})$ at 25°C, enthalpy change $H = +177 \text{ kJmol}^{-1}$ and entropy change $S = +285 \text{ JK}^{-1}\text{mol}^{-1}$. Calculate free energy change G at 25°C and predict whether the reaction is spontaneous or not.

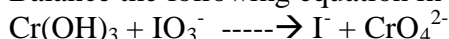


17. Explain giving reasons :-
- Boron does not form B^{3+} ions.
 - B-Cl bond has a dipole moment but BCl_3 has zero dipole moment.
 - Aluminium is used to make transmission cables.
 - Alkali metals impart colour to the flame.
 - Second ionization enthalpy of Na is higher than Mg.
18. Which of the two is bigger in size and why? Cl or Cl^-
19. What is the conjugate base of HCO_3^- and H_2O ?
20. Why are metallic hydrides used for storing hydrogen?
21. Name the two methods for estimation of nitrogen.
22. Yellow light emitted from a sodium lamp has a wavelength (λ) of 580 nm. Calculate frequency (ν) and wave number of the yellow light?
23. Calculate the oxidation number of Mn in K_2MnO_4 and N in HNO_3 .
24. Compound 'A' with the molecular formula C_5H_8 reacts with hydrogen in the presence of Lindlar's catalyst to form a compound 'B' with the molecular formula C_5H_{10} . 'A' on reacting with sodium in liquid ammonia forms a compound 'C' with same molecular formula as that of 'B'. Identify A, B and C. Also write the chemical reactions involved.
25. Write the general electronic configuration of p-block and f-block elements.
26. Which of the following free radicals is most stable and why?
27. Write a short note on the following:-
- Wurtz reaction
 - Friedel-crafts alkylation
28. Define the following terms:-
- Biological Oxygen Demand (BOD)
 - Eutrofication.
29. Give reasons for the following:-
- $[SiF_6]^{2-}$ is known whereas $[SiCl_6]^{2-}$ is not known.
 - Diamond is covalent, yet has high melting point.
 - BF_3 behaves as Lewis acid.
 - F has lower electron gain enthalpy than Cl.
 - Ionization enthalpy of N is higher than O.
 - Falling liquid drops are spherical.
 - Conc. HNO_3 can be stored in aluminium container.
30. Explain structure of Diborane.
31. A hydrocarbon 'Y' decolourises bromine water. On ozonolysis it gives 3-Methylbutanal and formaldehyde. Identify the name of the compound.
32. Which of these contain the largest number of atoms, 1g Li and 1g Na ?
33. Which of the two has higher dipole moment and why? NF_3 or NH_3 .
34. Balance the following chemical equation in acidic medium by half reaction method.
- $$Cr_2O_7^{2-} + C_2H_4O \rightarrow C_2H_4O_2 + Cr^{3+}$$
35. How many electrons and protons are there in following nuclei?



36. Which of the two is more ionic and why? NaCl or NaI.
 37. What do you mean by 15 volume H_2O_2 solution?
 38. The density of 3M solution of NaCl is 1.25g/mL. Calculate the molality of the solution.
 39. What is photochemical smog and what are its harmful effects?
 40. In which C-C bond of $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$, the inductive effect is expected to be least?
 41. Which of the following compound shows geometrical isomerism?
 a) Pent-1-ene b) Pent-2-ene c) 2-Methylbut-2-ene.
 42. Give mechanism of addition of HBr to propene.
 43. Temporary hardness in water is due to presence of which salts?
 44. Give IUPAC name and symbol of element with atomic number 110 and 115.
 45. What are the necessary conditions for an system to be aromatic?

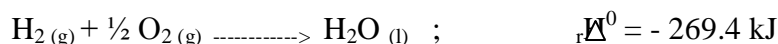
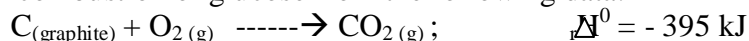
46. Balance the following equation in alkaline medium:-



47. On a ship sailing in pacific ocean where temperature is 23.4°C , a balloon is filled with 2 L air. What will be the volume of the balloon when the ship reaches Indian ocean, where temperature is 26.1°C ?

48. Calculate the energy associated with the first orbit He^+ . What is the radius of this orbit?

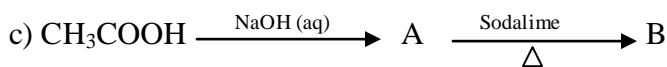
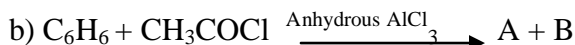
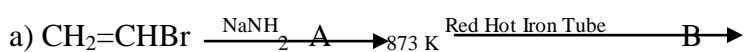
49. Calculate the enthalpy of combustion of glucose from the following data:-



50. Fishes grow well in cold water as compared to warm water. Why?

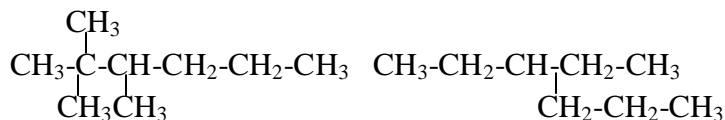
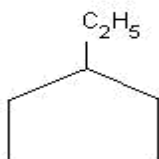
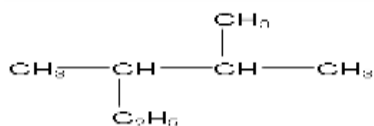
51. Name two major green house gases.

52. Complete the following chemical equations:-



53. Which isotope of hydrogen is radioactive in nature?

54. Write the correct IUPAC name of the following compounds :-



55. Out of MgCO_3 , CaCO_3 , SrCO_3 , and BaCO_3 which alkaline earth metal carbonate is thermally most stable?
56. 50 kg of $\text{N}_2(g)$ and 10 kg of $\text{H}_2(g)$ are mixed to produce $\text{NH}_3(g)$, identify the limiting reagent. Also calculate the amount of NH_3 formed.
57. What is the frequency and wavelength of a photon emitted during a transition from $n=6$ to $n=1$ state in the hydrogen atom.
58. a) Explain why the electronic configuration $n=1, l=0, m_l=+1, m_s=+1/2$ is not possible?
b) Write electronic configuration of Cu and Cu^{2+} .