

## Class – 10 HOTS Questions (Chemistry)

### Chapter – 1

1. An aqueous solution of metal nitrate P reacts with sodium bromide solution to form a yellow ppt. of a compound Q which is used in photography. Q undergoes photochemical decomposition. Identify and name P and Q. Write the chemical equation for the reactions involved. Also identify the type of reaction.
2. A reddish brown vessel developed a green coloured solid X upon exposure to air. The vessel upon reacting with dil. sulphuric acid forms a blue coloured solution and a gas Y. X decomposes to form the black oxide Z of the reddish brown metal and the gas Y. Identify and name X, Y, Z. Write the chemical equation for the reactions involved. Also identify the type of reaction.
3. Astha has been collecting silver coins. One day she observed a black coating on them. Which chemical phenomenon is responsible for this? Write the name of the substance responsible for the black coating. Suggest some steps to prevent this process.
4. Write the equation for a combination reaction as directed –
  - a) element + element
  - b) compound + element
  - c) compound + compound

How will you classify them in terms of change in energy ?

### Chapter – 2

1. Write the chemical equations to show the formation of washing soda from baking soda. Write one use each for washing soda and baking soda.
2. Equal quantities of HCl and CH<sub>3</sub>COOH having same concentration is given to you.
  - a) Which is a strong acid and why?
  - b) Why are both of them known as electrolyte but not conductor?
3. What change will be shown by the solution of AlCl<sub>3</sub> with blue and red litmus paper. Explain.
4. What will you observe when both dry and moist blue litmus paper is brought in contact with fumes of hydrogen chloride? Explain your observation.

### Chapter – 3

1.
  - a) A metal acts as a good reducing agent. It reduces Fe<sub>2</sub>O<sub>3</sub> and MnO<sub>2</sub>. Identify the metal. Write the chemical equation involved.
  - b) Can you select a non-metal to reduce the above two oxides? Give reasons for your answer.
2. Nikita took Al, Zn, Cu, Fe, Mg, Na metal and reacted each metal separately with cold water, hot water, and steam. Identify the metal(s) which reacts with – cold water, hot water, and steam. Also write the chemical equations for the reactions. Arrange the metals in the increasing order of their reactivity.
3. An element X on reacting with oxygen forms X<sub>2</sub>O. This oxide dissolves in water and turns red litmus blue. Predict whether the element is metal or non-metal giving reason. Also state the type of bond in X<sub>2</sub>O and show the bonding with electron dot representation.
4. A student was given Mg, Zn, Fe and Cu. Identify which of them –
  - a) will not displace hydrogen gas with dil. HCl
  - b) forms a pale green substance with dil. HCl
  - c) will give hydrogen with very dil. HNO<sub>3</sub>

- d) will be displaced from its salt solution by all the other remaining metals
- e) burns vigorously when the powdery form is sprinkled over the flame
- f) is obtained in carbonate and sulphide form
- g) forms an amphoteric oxide
- h) is obtained by the electrolysis of its molten salt during its metallurgical extraction

#### Chapter – 4

1. An organic compound A having molecular formula  $C_2H_4O_2$  reacts with sodium metal and evolves a gas B which readily catches fire. A also reacts with ethanol in the presence of conc. sulphuric acid to form a sweet smelling substance C which is used in making perfumes.
  - a) Identify A, B and C.
  - b) Write chemical equations to represent the conversion of : A to B and A to C.
2. 'A' works well with hard water. 'B' works well with soft water. Identify A and B and write their chemical composition. Name the reaction by which you will obtain B. Give a chemical equation to obtain B from suitable reactants.
3. Hydrocarbons  $C_2H_6$  and  $C_2H_4$  are given to you.
  - a) Upon burning them separately in Bunsen flame, indicate the colour of the flame produced.
  - b) Write their structural formula.
  - c) Write a chemical test to distinguish between the two.
  - d) Write the formula of their lower homologue.
4. Write the structural formula of the following organic compounds & identify the functional group by encircling it.
  - a) 3-methyl butan-2-one
  - b) 2, 3-dibromo propan-2-ol
  - c) an organic compound with 3 carbon atoms and an aldehyde group
  - d) an organic compound with 2 carbon atoms with a carboxylic acid group

#### Chapter – 5

1. Four elements with their atomic number are given – P (17), Q (12), R (10), S (15)
  - a) Which of these elements will have a complete octet?
  - b) Which of these elements will belong to the 15<sup>th</sup> group?
  - c) Which of these elements belong to the 3<sup>rd</sup> period?
  - d) Arrange the elements in the same period in decreasing order of non-metallic character.
  - e) To which family of elements does P belong?
  - f) Write the formula of the oxide of Q.
  - g) Show the bond formation of the molecule of S.
  - h) Which of them shows two valences?
2. Why are isotopes not placed separately in the modern periodic table?
3. *Ca* (20), *Mg* (12), *Be* (4). What is common in the electronic configuration of these elements? What is its significance?
4. What are anomalous pairs with respect to Mendeleev's Classification?