



# SHIKSHA CLASSES

## BOARD ANSWER PAPER

Subject : Chemistry

Topic : 7 - Elements of

Total Marks : 20

Class : XII

Groups 16, 17 and 18

### Section (A)

**Q.1 : a) Select and write the most appropriate answer from the following alternatives of each sub question. (05)**

**i) Which of the following is diatomic?**

**Ans :** a) O

**ii) The outer electronic configuration of group 17 elements is**

**Ans :** c)  $ns^2np^5$

**iii) Which of the following noble gas is not found in atmosphere?**

**Ans :** c) Rn

**iv) +3 oxidation state is most stable for**

**Ans :** b) bismuth

**v) In interhalogen compounds, which of the following halogens is never the central atom?**

**Ans :** d) F

**Q.1 : (b) Very short answer type Question. [2]**

**1) Give the two important uses of chlorine.**

**Ans :** Chlorine is used

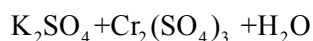
i) For purification (sterilizing) of drinking water

ii) In the manufacture of dyes, drugs and organic compounds such as  $CCl_4$ ,  $CHCl_3$ , DDT, Refrigerants etc.

**2) How does  $SO_2$  reduce :**

**i) Acidified  $K_2Cr_2O_7$**

**Ans :** It turns Sol<sup>n</sup> of  $K_2Cr_2O_7$  to green.



### Section (B)

**Q.2 : Answer the following question (Any three). (06)**

**1) Why 'F' shows anomalous behaviour than rest of the members in the group?**

**Ans :** Due to i) small atomic size

ii) High electronegativity

iii) Absence of d-orbitals in valence shell

iv) Low F-F bond dissociation enthalpy.

**2) What are the two allotropes of sulfur? Explain their method of preparation.**

**Ans :** Allotropes of sulphur : 2 Allotropes

Rhombic sulphur ( $\alpha$  - sulphur)

Monoclinic sulphur ( $\beta$  - sulphur)

**Preparation :**

i) Rhombic sulphur ( $\alpha$  - sulphur) is prepared by evaporation of roll sulphur in  $CS_2$ .

ii) Rhombic sulphur melted in a dish & cooled till crust is formed. Two holes are made in the crust & remaining liquid is poured out to give needle shaped crystals of  $\beta$ -sulphur.

**3) F Shows only - 1 oxidation state while other halogens shows +1, +3, +5, +7 oxidation states, Explain.**

**Ans :** i) Halogens have outer electronic configuration  $ns^2np^5$ . Hence element tends to gain one electron to attend stable configuration.

ii) Therefore they show monovalency and - 1 oxidation state.

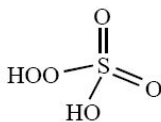
iii) F is most electronegative and shows only - 1 oxidation state while other can show v

aries oxidation state due to presence of 'd' orbital.

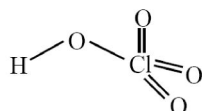
iv) F do not have 'd' orbital hence electrons can not expand and unable to show high oxidation state.

4) Draw the structures of a) Trisulphuric acid  $H_2S_2O_3$  b) Perchloric acid  $HClO_4$ .

Ans : a) Trisulphuric acid  $H_2S_2O_3$



b) Perchloric acid  $HClO_4$ .



### Section (C)

Q.3 : Answer the following question (any one). (03)

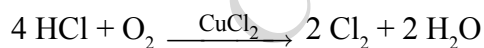
1) Explain

a) Deacon's process of manufacture of chlorine

b) Bleaching property of chlorine

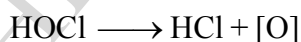
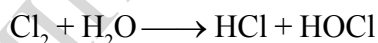
Ans : a) Deacon's process of manufacture of chlorine :

Chlorine is manufactured by the oxidation of hydrogen chloride gas by atmospheric oxygen in the presence of  $CuCl_2$  as catalyst at 723 K.

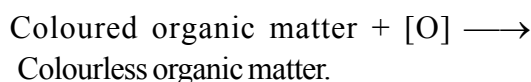


b) Bleaching property of chlorine :

Chlorine requires the presence of moisture (water) for bleaching. It liberates nascent oxygen from water which is responsible for oxidising & bleaching property.



Chlorine bleaches vegetable matter or coloured organic matter in the presence of moisture to colourless matter.



2) Write the general characteristics of interhalogen compounds.

Ans : General characteristics of interhalogen compounds :

1. The compound is considered as the halide of X. For example,  $ClF$ . Here the halogen having larger size is chlorine, it is more electropositive than F and hence the interhalogen compound is named as chlorine monofluoride. (n) is the number of atoms of X' attached to X. As the ratio [radius of X : radius of X'] increases the value of n also increases.

2. Interhalogen compounds have even number of atoms 2, 4, 6, 8. For example,  $ClF_3$  has 4 atoms.

3. The properties of interhalogen compounds are generally intermediate between those of the halogens from which they are made.

4. The central halogen exhibits different oxidation states in different interhalogen compounds.

5. Number of X' atoms in the compounds is always odd.

6. They are all diamagnetic.

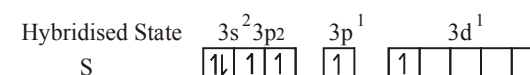
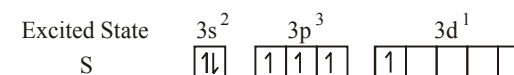
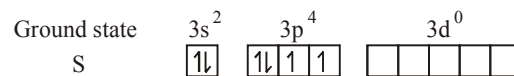
### Section (D)

Q.4 : Answer the following question. (Any one) (04)

1) a) Explain the structure of  $SO_2$

Ans : i) The molecule has bent structure with O - S - O bond angle of  $119^\circ$ , sulphur is  $sp^2$  hybridised and the lone pair of electrons of sulphur reduces the angle from  $120^\circ$  to  $119^\circ$ .

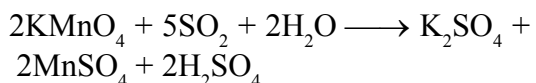
ii) Two  $\sigma$  bonds and one  $p\pi-p\pi$  bond &  $p\pi-d\pi$  bond present between sulphur & oxygen.



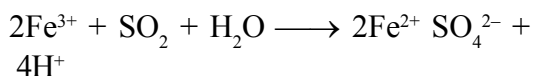
**b) Explain the reducing property of SO<sub>2</sub> with example.**

**Ans :** SO<sub>2</sub> acts as a reducing agent in the presence of moisture.

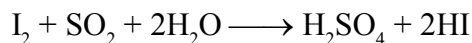
i) Moist sulphur dioxide decolourises acidified potassium permanganate. (VII solution)



ii) Moist sulphur dioxide reduces ferric salts into Ferrous salts.

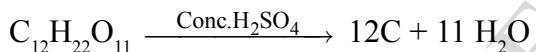


iii) It reduces halogens to halogen acids



**2) a) Explain the dehydrating property of sulphuric acid.**

**Ans :** Concentrated sulphuric acid is strong dehydrating agent. Sulphuric acid removes water from sugar & carbohydrates. Carbon left behind is called sugar charcoal and the process is called charring.



**b) What are the uses of sulphuric acid?**

**Ans : It is used :**

- i) In storage batteries
- ii) In detergent industry
- iii) In petroleum refining
- iv) In the manufacture of pigments, paints and dyestuff intermediates.

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