



INDIAN SCHOOL AL WADI AL KABIR

Class: XII	Department: SCIENCE 2020 -21 Subject: CHEMISTRY	Date of submission: 28.10.2020
Worksheet No: 10	Chapter: THE p BLOCK ELEMENTS	Note: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

- Among the following which is the strongest oxidizing agent?
 - Br₂
 - Cl₂
 - F₂
 - I₂
- The shape of XeF₄ is
 - tetrahedral
 - square planar
 - pyramidal
 - linear
- The boiling points of hydrides of group 16 are in the order
 - H₂O > H₂Te > H₂S > H₂Se
 - H₂O > H₂S > H₂Se > H₂Te
 - H₂O > H₂Te > H₂Se > H₂S
 - None of these
- The set with correct order of acidity is
 - HClO < HClO₂ < HClO₃ < HClO₄
 - HClO₄ < HClO₃ < HClO₂ < HClO
 - HClO < HClO₄ < HClO₃ < HClO₂
 - HClO₄ < HClO₂ < HClO₃ < HClO
- The formation of O₂⁺ [PtF₆]⁻ is the basis for the formation of first xenon compound. This is because
 - O₂ and Xe have different sizes.
 - both O₂ and Xe are gases.
 - O₂ and Xe have comparable electronegativities.
 - O₂ and Xe have comparable ionisation enthalpies.
- Which of the following is the correct statement?
 - F₂ has higher dissociation energy than Cl₂.
 - F has higher electron affinity than Cl.
 - HF is stronger acid than HCl.
 - Boiling point increases down the group in halogens.

7. Among the following compounds, which on heating do not produce N_2 ?

- a. $(NH_4)_2Cr_2O_7$
- b. $NH_4Cl + NaNO_2$
- c. $NH_4Cl + CaO$
- d. $Ba(N_3)_2$

8. Bleaching action of SO_2 is due to its

- a. acidic property
- b. basic property
- c. reducing property
- d. oxidising property

9. Match the interhalogen compounds of column I with the geometry in Column II .

Column I

i. XX'_3

ii. XX'_5

iii. XX'_7

- a. i - q , ii - r , iii - p
- b. i - q , ii - p, iii - r
- c. i - r, ii - p , iii - q
- d. i - p, ii - q , iii - r

Column II

p. Pentagonal bipyramidal

q. Bent T shape

r. Square pyramidal

10. Assertion: Finely divided iron does not form ferric chloride with HCl.

Reason: HCl produces hydrogen gas with iron.

- a. If both Assertion and Reason are true and Reason is the correct explanation of the Assertion.
- b. If both Assertion and Reason are true and Reason is not a correct explanation of the Assertion.
- c. If Assertion is true but Reason is false.
- d. If Assertion is false and Reason is true.

11. Complete the following equations.

i. $XeF_2 + H_2O \rightarrow$

ii. $I_2 + HNO_3 \text{ (conc)} \rightarrow$

iii. $XeF_4 + H_2O \rightarrow$

iv. $NaOH \text{ (hot and conc)} + Cl_2 \rightarrow$

v. $XeF_4 + O_2F_2 \rightarrow$

12. Give reasons for the following.

- a. Sulphur in vapour state exhibits paramagnetic behaviour.
- b. In the structure of HNO_3 , the N-O bond (121 pm) is shorter than the N-OH bond (140 pm).
- c. ICl is more reactive than I_2 .
- d. The electron gain enthalpy with negative sign for Fluorine is less than that of Chlorine, still Fluorine is a stronger oxidizing than Chlorine.

- e. Helium is used in driving apparatus as a diluent for oxygen.
- f. Oxygen has less electron gain enthalpy with negative sign than Sulphur.
- g. H_2Te is the strongest reducing agent amongst all the hydrides of Group 16 elements.
- h. N_2 is less reactive at room temperature.

13. What happens when

- a. Chlorine gas is passed through a cold dilute solution of NaOH ?
- b. Sulphur dioxide gas is passed through an aqueous solution of Fe(III) salt?

14. Answer the following.

- a. Why does fluorine not play the role of a central atom in interhalogen compounds?
- b. Why do noble gases have very low boiling points?

15. Predict the shape and the asked angle (90° or more or less) in each of the following cases:

- i. ClF_3 and the angle F-Cl-F
- ii. XeF_2 and the angle F-Xe-F

16. Account for the following statements.

- i. Fluoride ion has higher hydration enthalpy than chloride ion.
- ii. Nitrogen do not form pentahalide.
- iii. Thermal stability decreases from H_2O to H_2Te .

17. Give the formula and describe the structure of a noble gas species which is isostructural with

- i. ICl_4^-
- ii. IBr_2^-
- iii. BrO_3^-

18. Arrange the following in the order of property indicated for each

- i. HF , HCl , HBr , HI (increasing acidic strength)
- ii. NH_3 , PH_3 , AsH_3 , SbH_3 , BiH_3 (increasing base strength)

19. Arrange the following in the decreasing order of their reducing character.

HF , HCl , HBr , HI

20. Give reasons

When Cl_2 reacts with excess of F_2 , ClF_3 is formed and not FCl_3

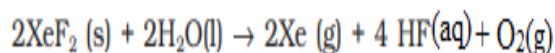
21. Among the hydrides of group 15 elements, which have the

- a. lowest boiling point?
- b. maximum basic character?
- c. highest bond angle?
- d. maximum reducing character?

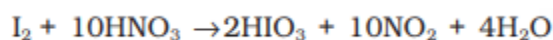
Hint

1. c
2. b
3. c
4. a
5. d
6. d
7. c
8. c
9. a
10. a

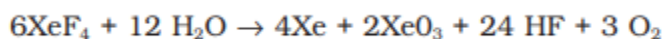
11. i.



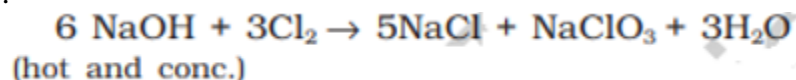
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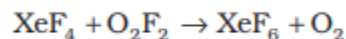
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iv.

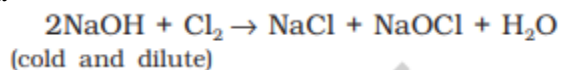


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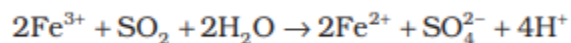


12. a. Due to unpaired electrons in the antibonding π^* orbital
- b. N-O bond has partial double bond character due to resonance. N-OH bond is a single bond.
- c. Due to dissimilar atoms with different electronegativities.
- d. Low enthalpy of dissociation of F-F bond and high hydration enthalpy of F.
- e. Less reactive, noble gas. Very less solubility in blood.
- f. The electron is added to larger $n=3$ level in S and therefore less electron – electron repulsion.
- g. Weak overlapping between large orbitals of Te and small orbitals of H
- h. Triple bonded, very stable

13. a



b.



- 14 a. Small size and absence of d orbitals.
- b. Very weak van der Waals forces.

15. i. Less than 90° , Bent T structure
- ii. More than 90° , Linear structure

16. i. Small size, high electronegativity of F.
ii. Absence of d orbitals
iii. Bond dissociation enthalpy decreases down the group.
17. i. XeF_4 , Square planar, Draw structure
ii. XeF_2 , Linear , draw structure
iii. XeO_3 , Trigonal pyramidal
18. i. $\text{HF} < \text{HCl} < \text{HBr} < \text{HI}$
ii. $\text{BiH}_3 < \text{SbH}_3 < \text{AsH}_3 < \text{PH}_3 < \text{NH}_3$
19. $\text{HI} > \text{HBr} > \text{HCl} > \text{HF}$
20. Fluorine does not possess d orbitals, so it cannot expand its octet to bond with three chlorine atoms and form FCl_3 . Chlorine has empty d orbitals and thus, it can expand its octet to bond with three fluorine atoms and form ClF_3 .
21. a. PH_3
b. NH_3
c. NH_3
d. BiH_3

PREPARED BY : MS. JASMIN JOSEPH	CHECKED BY : HOD - SCIENCE
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