P-BLOCK ELEMENTS -VI A GROUP ELEMENTS

2011

1. Which is not the correct statement ? **[DUMET]**

1. The S_8 ring is not planar
2. Oxygen is more electronegative than sulphur.
3. SF_8 exists, but OF_4 does not exist
4. SO_3 and SO_3^{2-} both have trigonal planar geometry

2010

2. If the supply of oxygen is limited, H_2S reacts with O_2 to form **[AFMC]**

1. $H_2O + SO_3$
2. $H_2O + SO$
3. $H_2SO_4 + S$
4. $H_2O + SO_2$

3. Bromine water reacts with SO_2 to form **[AFMC]**

1. HBr and S
2. H_2O and HBr
3. S and H_2O
4. H_2SO_4 and HBr

4. O_2 and O_3 are **[CPMT]**

1. allotropes
2. isotopes
3. isomorphs
4. polymorphs

5. Ozone can be tested by **[Haryana PMT]**

1. Ag
2. Hg
3. Zn
4. Au

6. Sulphur trioxide gas when dissolved in H_2SO_4 the product obtained is **[OJEE]**

1. H_2SO_3
2. H_2SO_5
3. $H_2S_2O_7$
4. $H_2S_2O_8$

7. α and β forms of sulphur are at equilibrium at a temperature known as **[OJEE]**

1. Critical temperature
3. Transition temperature
3. Boyle's temperature
4. Inversion temperature

8. Which of the following statements regarding ozone is not correct? [WB JEE]

1. The ozone molecule is angular in shape

2. The ozone is a resonance hybride of two structures

3. The oxygen-oxygen bond length in ozone is identical with that of molecular oxyen.

4. Ozone is used as germicide and disinfectant for the purification of air.

9. Caro's acid is [VMMC]

1. $H_2S_2O_3$ 2. H_2SO_5 3. $H_2S_2O_8$ 4. $H_2S_2O_7$

10. When nitric acid reacts with nitric oxide, a gas is released, which converts H_2S into [AIIMS]

1. SO_4^{2-} 2. S^{2-} 3. S 4. $S_2O_5^{2-}$

11. Peroxide bond is absent in [CPMT]

1. $(S_2O_7)^{2-}$ 2. $(S_2O_8)^{2-}$ 3. CrO_5 4. BaO_2

12. The type of bonds present in sulphuric anhydride [EAMCET]

1. 3σ and three $p\pi - d\pi$ 2. 3σ ,one $p\pi - p\pi$ and two $p\pi - d\pi$

3. 2σ and three $p\pi - d\pi$ 4. 2σ and two $p\pi - d\pi$

13. The acid having O – O bond is [CG PMT, Haryana PMT]

1. $H_2S_2O_3$ 2. $H_2S_2O_6$ 3. $H_2S_2O_8$ 4. $H_2S_4O_6$

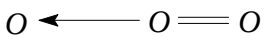
14. The correct order of acidic strength is [CG PMT, Haryana PMT]

1. $Cl_2O_7 > SO_2 > P_4O_{10}$ 2. $CO_2 > N_2O_5 > SO_3$

3. $Na_2O > MgO > Al_2O_3$ 4. $K_2O > CaO > MgO$

2008

15. Perdisulphuric acid has the following bond **[AIIMS]**

1. 
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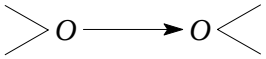
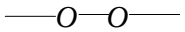
3. 
4. 

16. S^{2-} **and** SO_3^{2-} **can be distinguished by using** **[AIIMS]**

1. $(CH_3COO)_2 Pb$
2. $Na_2[Fe(CN)_5 NO]$
3. Both (a) and (b)
4. None of the boave

17. Assertion The S – S – S bond angle in S_8 **molecule is** 105^0**.**

Reason S_8 **has V-shape.** **[AIIMS]**

1. Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
2. Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
3. Assertion is true but Reason is false.
4. Both Assertion and Reason are false.

18. Which of the following salt would give SO_2 **with hot and dil.** H_2SO_4 **and also decolurises** Br_2 **water** **[Manipal]**

1. Na_2SO_3
2. $NaHSO_4$
3. Na_2SO_4
4. Na_2S

19. Ozone is used for purifying water because **[BCECE]**

1. it dissociates and relese oxygen
2. do not leave any foul smell like chlorine.
3. kills bacteria, cyst, fungi and acts as a biocide
4. All of the above

20. H_2S **is not a/an**

1. reducing agent
2. acidic
3. oxidising agent
4. None of these

21. When conc. H_2SO_4 is heated with P_2O_5 ,the acid is convered into

1. sulphur trioxide
2. sulphur dioxide
3. sulphur
4. a mixture of sulphur dioxide and sulphur trioxide

22. $KMnO_4$ is a strong oxidising agent in acid medium. To provide acid medium H_2SO_4 is used instead of HCl. This is because [Kerala CEE]

1. H_2SO_4 is a stronger acid than HCl.
2. HCl is oxidised by $KMnO_4$ to Cl_2
3. H_2SO_4 is a dibasic acid
4. rate is faster in the presence of H_2SO_4

23. The sides of safety matches contains [BCECE]

1. red phosphorus + sand power
2. P_4S_3
3. $Ca_3(PO_4)$ + glass pieces
4. $KClO_3, KNO_3$, sulphur + antimony

VIA GROUP ELEMENTS PREVIOUS QUESTIONS

KEY

1) 4	2) 2	3) 4	4) 1	5) 2	6) 3	7) 2	8) 3	9) 2	10) 3
11) 1	12) 2	13) 3	14) 1	15) 4	16) 3	17) 3	18) 1	19) 4	20) 3
21) 1	22) 2	23) 1							

VIA GROUP ELEMENTS PREVIOUS QUESTIONS (SOLUTIONS)

1. SO_3 is trigonal planar due to sp^2 hybridised sulphur.

   SO_3^{2-} is sp^3 hybridised but pyramidal due to the presence of lone pair of electrons.

2. In limited supply of oxygen, H_2S buns with blue flame and S and H_2O are the main products

   $$2H_2S + O_2 \rightarrow 2H_2O + 2S$$

   Note In excess of oxygen, H_2S gives SO_2 and water as main product.

3. When bromine water reacts with SO_2, it oxidises it to sulphuric acid and itself gets reduced to HBr.

   $$Br_2 + 2H_2O + SO_2 \rightarrow 2HBr + H_2SO_4$$

   Bromine water

4. Since, in O_2 and O_3 different these number of same element, i.e., oxygen is present, hence these are allotropes.

   Note Different crystalline structure, different number of atoms and different muclear spins all result in allotropy.

5. Ozone can be tested by Hg (mercury).

   $$2Hg + O_3 \rightarrow \underset{\substack{\text{mercurous}\\ \text{oxide}}}{Hg_2O} + O_2$$

   During this reaction mercury loses its meniscus and starts sticking to the side of the glass. This is known as tailing of mercury.

6. $$SO_3 + H_2SO_4 \rightarrow \underset{\text{oleum}}{H_2S_2O_7}$$

7. The temperature at which both the varieties of sulphur co-exist, is called transition temperature.

   $$\alpha - sulphur \underset{<369K}{\overset{>369K}{\rightleftharpoons}} \beta - sulphur$$

8. Due to resonance the bond order in ozone is 1.5, hence O – O bond length in O_3 is greater than O – O bond length O_2.

9. H_2SO_5 (peroxomono sulphuric acid) is known as Caro's acid.

10. When nitric acid (HNO_3) reacts with nitric oxide (NO), NO_2 gas is relesed which oxidises H_2S into sulphur. The reactions are as follows:

    $$2HNO_3 + NO \rightarrow H_2O + 3NO_2$$
    $$NO_2 + H_2S \rightarrow H_2O + S + NO$$

14. Acidic strength of oxides increases along a period from left to right and decreases along a group from upward to downward. Therefore, the correct order of acidic strength is

$$Cl_2O_7 > SO_2 > P_4O_{10}$$

[$\because$ the position of Cl, S and P along a period is as P,S and Cl]

16. $S^{2-} + (CH_3COO_2)Pb \rightarrow \underset{\substack{black\\ppt.}}{PbS} \downarrow + 2CH_3COO^-$

$$S^{2-} + Na_2\left[Fe[CN]_5 NO\right] \rightarrow \underset{violet\ ppt.}{\left[Fe(CN)_5 NOS\right]^{4-}} + 2Na^+$$

Hence, they are distinguished by both the reagents as only S^{2-} gives precipitate with these reagents.

17. S-atom in S_8 molecule are sp^3 – hybridised and contain two lone pair of electrons on each and exist as staggered eight atom rings.

18. Na_2SO_3 reacts with hot and dil. H_2SO_4 to give SO_2 gas which decolurieses bromme water.

19. Ozone is used for purifying water because ozone kills the bacteria, cysts, fungi, mold, parasites, viruses, contaminates, etc. It is one of the effective wayof eliminating microorganisms in the water. Ozone is most effective oxidant (secondary to F_2). It inactivates and bacteria faster than chlorine. Ozone do not form TMH which have unpleasant odour and also carcinogenic. Ozone is very good bicocide. Ozone also absorbs UV radiation.

20. Only H-atom is directly attached to P. H_2S acts a reductions agent, because it can reduce PbO into PbS. $PbO + H_2S \rightarrow Pbs + H_2O$

It is acidic in nature. In chalcogens, the acidic nature of hydride increases from H_2O to H_2 Te.

21. When conc. H_2SO_4 is heated with P_2O_5, the acid is converted into sulphur trioxide.

$$2H_2SO_4 + 2P_2O_5 \rightarrow \underset{sulphur\ trioxide}{2SO_3} + 4HPO_3$$

22. $KMnO_4$ is strong oxidising agent in acidic medium H_2SO_4 is used instead of HCl to provide acidic medium because of HCl is oxidized by $KMnO_4$ into Cl_2.

23. The head of match stick contains $KClO_3, KNO_3$, sulphur and antimony.

The sides of match box contains red phosphorus and sand power.

P_4O_3 is used in strike anywere matches.