

P-BLOCK ELEMENTS

VI A GROUP ELEMENTS (SUB TOPIC-I)

SUB TOPIC-I (PRACTICE QUESTIONS)

1. The atomic number of sulphur is 16, in the ground state of sulphide ion, the electronic configuration is

1. $1s^2 2s^2 2p^6 3s^2 3p^2$ 2. $1s^2 2s^2 2p^6 3s^2 3p^4$
3. $1s^2 2s^2 2p^6 3s^2 3p^6$ 4. $1s^2 2s^2 2p^6 3s^2 3s^4 3p^6$

2. The electronic configuration $1s^2 2s^2 2p^5 3s^1$ represents which one of the following:

1. An excited state of fluorine atom 2. The ground state of neon
3. An excited state O^{2-} ion 4. The ground state of F^- ion

3. The decreasing tendency to exist in puckered 8-membered ring structure is

1. $S > Se > Te > Po$ 2. $Se > S > Te > Po$ 3. $S > Te > Se > Po$ 4. $Te > Se > S > Po$

4. Which one of the following bonds has the highest bond energy?

1. O – O 2. S – S 3. Se – Se 4. Te – Te

5. The increasing thermal stability of the hydrides of group 16 follows the sequence

1. H_2O, H_2S, H_2Se, H_2Te 2. H_2Te, H_2Se, H_2S, H_2O
3. H_2S, H_2O, H_2Se, H_2Te 4. H_2Se, H_2S, H_2O, H_2Te

6. The correct order of increasing boiling point is

1. H_2S, H_2O, H_2Te, H_2Se 2. H_2O, H_2S, H_2Se, H_2Te
3. H_2Te, H_2Se, H_2S, H_2O 4. H_2S, H_2Se, H_2Te, H_2O

7. $TeCl_4$ is expected to be

1. Tetrahedral 2. Square planar 3. Octahedral 4. Trigonal bipyramid

8. In S_8 molecule, the type of hybridization exhibited by sulphur is

1. sp^2 2. sp^3 3. Sp 4. sp^3d

9. The S-S-S bond angle in S_8 molecule is

1. 109.5° 2. 105° 3. 120° 4. 60°

10. The correct increasing order of dipole moments of the following is

1. $H_2O < H_2S < H_2Se < Te$ 2. $H_2Te < H_2Se < H_2S < H_2O$
3. $H_2Se < H_2Te < H_2O < H_2S$ 4. $H_2S < H_2O < H_2Se < H_2Te$

11. The correct order of decreasing stability of hexa fluorides of group VI A members is

1. $SF_6 > SeF_6 > TeF_6$ 2. $TeF_6 > SeF_6 > SF_6$
3. $SF_6 > TeF_6 > SeF_6$ 4. $TeF_6 > SF_6 > SeF_6$

12. The molecule having one $p\pi - p\pi$ and two $p\pi - d\pi$ bonds is

1. SO_2 2. SO_3 3. CO_2 4. N_2

13. The correct order of electron affinity of VIA elements is

1. $O < S < Se < Te$ 2. $O < Se < S < Te$ 3. $O < Te < Se < S$ 4. $O < Se < Te < S$

14. Regarding SCl_4 the wrong statement is

1. In SCl_4 the hybridization of S is sp^3 sp^3d and shape is distorted trigonal bipyramidal
2. The product of hydrolysis is H_2SO_3
3. It acts both as Lewis acid and Lewis base
4. It is very stable liquid

15. The order of acidic character of dioxides of VIA group elements is

1. $SeO_2 > TeO_2 > SO_2$ 2. $SeO_2 > SO_2 > TeO_2$
3. $SO_2 > SeO_2 > TeO_2$ 4. $TeO_2 > SO_2 > SeO_2$

16. Oxygen is always divalent whereas sulphur can form 2,4 and 6 bonds. This is because

1. Oxygen is more electronegative than sulphur
2. Sulphur contains d-orbitals whereas oxygen does not
3. Sulphur has larger atomic radius than oxygen
4. Sulphur is more electronegative than oxygen

17. The bond angles of the hydrides of group VI A elements decrease as we move down the group. The is because of

1. Increase in bond pair-bond pair repulsion
2. Decrease in bond pair-bond pair repulsion
3. Decrease in electronegativity of the central atom
4. Increase in electronegativity of the central atom

18. The correct order of the X-O-X bond angles are

1. $F_2O > Cl_2O > Br_2O$
2. $F_2O > Br_2O > Cl_2O$
3. $Br_2O > Cl_2O > F_2O$
4. $Cl_2O > F_2O > Br_2O$

19. The oxidation number of oxygen in K_2O , K_2O_2 and KO_2 respectively is

1. -2, -1, -1/2
2. -1/2, -1, -2
3. -1, -2, -1/2
4. -2, -1/2, -1

20. The order of O – O bond length in O_3 , O_2 and H_2O_2 is

1. $H_2O_2 > O_2 > O_3$
2. $H_2O_2 > O_3 > O_2$
3. $O_3 > O_2 > H_2O_2$
4. $O_3 > H_2O_2 > O_2$

21. $O_3 + C_2N_2$ is used as a rocket fuel. The bonds in C_2N_2 are

1. $3\sigma, 4\pi$
2. $3\sigma, 3\pi$
3. $4\sigma, 2\pi$
4. $2\sigma, 2\pi$

22. The oxidation states of the most electronegative element in the product of the reaction of BaO_2 with dil. H_2SO_4 are

1. 0 and 1
2. -1 and -2
3. -2 and 0
4. -2 and +1

23. Identify the incorrect statement with respect to ozone

1. Ozone is formed in the upper atmosphere by a photochemical reaction involving dioxygen
2. Ozone is more reactive than dioxygen
3. Ozone is diamagnetic where as dioxygen is paramagnetic
4. Ozone protects the earth's inhabitant by absorbing gamma-radiations

24. Oxygen does not form OF_6 because

1. it has a small size
2. There are no vacant d-orbitals available
2. it has high ionization energy
3. it has large size

25. The structure of ozone can best be represented by



26. When Ozone reacts with which one of the following there is decrease in volume

1. PbS
2. $K_4[Fe(CN)_6]$
3. Ag
4. HCl

27. The wrong statement among the following is

1. A mixture of cyanogens and ozone is used as a rocket fuel
2. Ozone leaves tails with mercury due to the formation of Mercuric oxide on the surface.
3. Excess of sodium thiosulphate reacts with Auric chloride from $Na_3[Au(S_2O_3)_2]$
4. Concentrated solution of sodium thiosulphate solution due to the formation of sodium Argento thiosulphate.

28. Oleum is

1. $H_2SO_4 + SO_3$
2. $H_2SO_4 + SO_2$
3. $H_2SO_4 + H_2O_2$
4. $H_2SO_4 + H_2S_2$

29. Solution of SO_2 in water is known as

1. Sulphuric acid
2. Sulphurous acid
3. Hydrosulphuric acid
4. Thiosulphurous acid

30. O_2^{2-} is the symbol of.....ion

1. Oxide
2. Super oxide
3. Peroxide
4. Mono oxide

31. The products of the chemical reaction between $Na_2S_2O_3, Cl_2$ and H_2O are

1. $S + HCl + Na_2S$
2. $S + HCl + Na_2SO_4$
3. $S + HCl + Na_2SO_3$
4. $S + NaClO_3 + H_2O$

32. Which of the following ions does not have S-S linkage?

1. $S_2O_8^{2-}$
2. $S_2O_6^{2-}$
3. $S_2O_5^{2-}$
4. $S_2O_3^{2-}$

33. The reason why conc. H_2SO_4 is used largely to prepare other acids, that conc. H_2SO_4

1. Is highly ionized
2. Is dehydrating agent
2. Has a high specific gravity and density
4. Has a high boiling point

34. Pick out the ideal condition for H_2SO_4 manufactured by contact process

1. Low temperature, high pressure and high concentration of reactions
2. Low temperature, low concentration of reactants and low pressure
3. High temperature, high pressure and high concentration of reactants
4. Low temperature, low pressure and high concentration of reactants

35. With a dilute solution of hypo, silver nitrate gives a white precipitate which immediately turns black. The white precipitate and black precipitates are respectively

1. $Ag_2S_2O_3$ and Ag
2. $Ag_2S_2O_3$ and Ag_2S
3. $Ag_2S_2O_3$ and Ag_2O
4. $Ag_2S_2O_3$ and $Na_3[Ag(S_2O_3)_2]$

36. Sometimes a yellow turbidity appears while passing H_2S gas even in the absence of of II group radicals. This is because.

1. Sulphur is present in the mixture as impurity
2. IV group radicals are precipitated as sulphides
3. Of the oxidation of H_2S gas by some acid radicals
4. III group radicals are precipitated as hydroxides

37. The number of S-S bonds in sulphur trioxide trimer (S_3O_8) is

1. 3 2. 2 3. 1 4. 0

38. Compounds A and B are treated with dil. HCl separately. The gases liberated are Y and Z respectively. Y turns acidified dichromate paper green while Z turns lead acetate paper black. The compounds A and B are respectively

1. Na_2SO_3 and Na_2S 2. $NaCl$ and Na_2CO_3
3. Na_2S and Na_2SO_3 4. Na_2SO_3 and Na_2SO_4

39. A chalcogen combines directly with hydrogen with great difficulty to form a hydride. This chalcogen also burns in air to form a solid polymeric dioxide and has got the highest electrical resistance amongst metals. The chalcogen is

1. O 2. S 3. Te 4. Se

40. List-I List-II

- A) $O_3 + H_2O_2 \rightarrow$ 1) Blue
B) $O_3 + \text{starch KI} \rightarrow H_3PO_3$ 2) Tailing
C) $O_3 + Hg \rightarrow$ 3) HIO_3
D) $O_3 + I_2 + H_2O \rightarrow H_4P_2O_6$ 4) $O_2 + H_2O$
5) HI

The correct match is

	A	B	C	D
1.	5	2	3	4
2.	4	1	2	3
3.	1	4	3	2
4.	3	2	1	5

41. SO_3 is not directly absorbed in water because

1. It is insoluble in water
2. It is insoluble in water but soluble in H_2SO_4
3. It is reduced back to SO_2
4. It forms stable mist with water

42. A pale yellow substance (A) when heated with conc- H_2SO_4 liberates a brown colored gas (B). The substance (A) also dissolves in sodium sulphite solution on heating, a clear solution (C) is formed which on acidification gives a turbid solution and a pungent smelling gas in obtained. (A) when heated in air gives (D) Solution (C) decolorizes I_2 . Then A,B,C,D are respectively

	A	B	C	D
1.	S	NO_2	$Na_2S_2O_3$	SO_2
2.	S	Br_2	Na_2SO_3	SO_2
3.	S	NO	$Na_2S_2O_3$	SO_2
4.	S	NO_2	$Na_2S_2O_3$	SO_3

43. a) $SO_2 + 4H_2O \rightarrow X + HCl$

b) $X \rightarrow Y + H_2O$, here anhydride Y is

1. S_2O
2. SO_2
3. SO_3
4. H_2SO_3

- 44.**
- | List-I | List-II |
|-----------|---|
| A) O_3 | 1) Turns benzidine paper to brown |
| B) Hypo | 2) Turns anhydrous $CuSO_4$ to blue |
| C) H_2O | 3) Violet color with $FeCl_3$ |
| D) H_2S | 4) orange yellow color with chromic salts |
| | 5) Rotten egg smell |

The correct match is

	A	B	C	D
1.	3	2	1	4
2.	1	3	2	5
3.	2	4	3	5
4.	5	2	1	4

VI A GROUP ELEMENTS

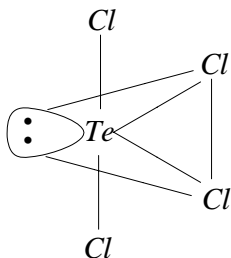
SUB TOPIC-I (KEY)

1) 3	2) 3	3) 1	4) 2	5) 2	6) 4	7) 4	8) 2	9) 2	10) 2
11) 1	12) 2	13) 3	14) 4	15) 3	16) 2	17) 3	18) 2	19) 1	20) 2
21) 1	22) 2	23) 4	24) 2	25) 3	26) 4	27) 2	28) 1	29) 2	30) 3
31) 3	32) 1	33) 4	34) 1	35) 2	36) 3	37) 4	38) 1	39) 3	40) 2
41) 4	42) 1	43) 2	44) 2						

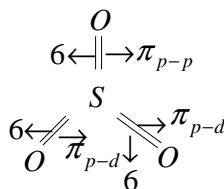
VI A GROUP ELEMENTS SUBTOPIC-I (SOLUTIONS)

4. Sulphur is octatomic

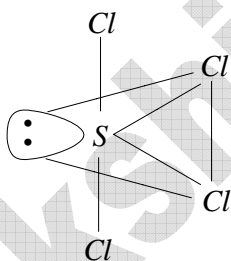
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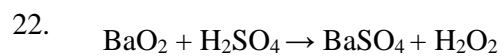
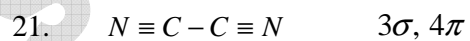
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14.

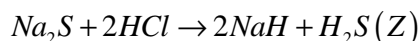
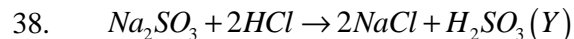
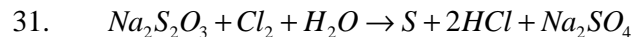
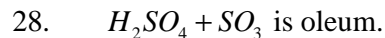


Sp^3d , Trigonal bipyramidal.



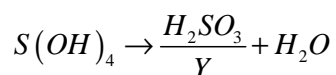
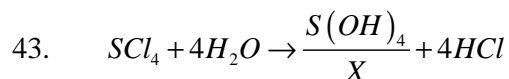
H_2O_2 , Oxidation state of oxygen is - 1

In $BaSO_4$, Oxidation state of oxygen is – 2



H_2SO_3 Turns acidified dictromate paper green

H_2S Turns leadacetate to black



SUB TOPIC-II (PRACTICE QUESTIONS)

1. Cyclic trimer structure of SO_3 contains:

1. 6 S = O bonds and three S – O – S bonds 2. 3 S = O bonds and three S – O – S

3. 6S = O bonds and six S – O – S bonds 4. None of these

2. The boiling points of H_2O_2, H_2S, H_2Se and H_2Te are in the following order

1. $H_2O > H_2S > H_2Se > H_2Te$

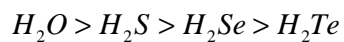
2. $H_2O > H_2Te > H_2Se > H_2S$

3. $H_2Te > H_2Se > H_2S > H_2O$

4. $H_2S > H_2O > H_2Te > H_2Se$

3. The statements regarding hydrides of VIA group elements are

i) The order of volatility ii) The order of B.P. iii) The order of bond angles



The correct combination is

1. All are correct 2. Only i is correct 3. ii & iii are correct 4. I & iii are correct

4.

List-I

List-II



1) 119.5° , Angular



2) $109^\circ.28'$, tetrahedron



3) 120° , Trigonal planar



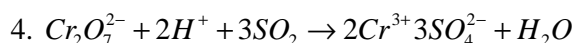
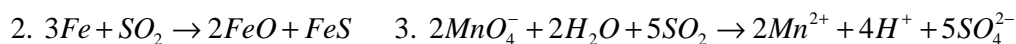
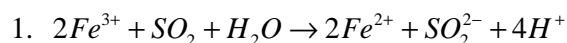
4) $104^\circ.30'$ angular

5) 116.5° Angular

The correct match is

	A	B	C	D
1.	2	1	4	5
2.	5	2	1	3
3.	3	1	4	5
4.	1	3	2	4

5. Which of the following equations represents the oxidizing action of sulphur dioxide?



6. Which of the following statement is true?

1. Both rhombic and monoclinic sulphur are soluble in water
2. Both rhombic and monoclinic sulphur are soluble in carbon disulphide
3. Both rhombic and monoclinic sulphur are insoluble in carbon disulphide
4. Rhombic sulphur can be converted in to monoclinic sulphur but the revers is not possible.

7. By passing SO_2 in solution of $K_2Cr_2O_7$, it turns green due to the formation of:?

1. $K_2Cr_2O_4$
2. Chromic acid
3. Chromium sulphate
4. None

8. A substance on treatment with dilute H_2SO_4 liberates a colorless gas which produces (i) turbidity with baryta water and (ii) turns acidified dichromate solution green. These reactions indicated the presence of

1. CO_3^{2-}
2. S^{2-}
3. SO_3^{2-}
4. NO_2^-

9. The Spring's reaction for the preparation of sodium thiosulphate involve the following reactants

1. $Na_2SO_3 + S$
2. $Na_2S + Na_2SO_3 + I_2$
3. $2Na_2S + Na_2CO_3 + 4SO_2$
4. $4S + 6NaOH$

10. A and B are two salts. A reacts both with dil H_2SO_4 and conc. H_2SO_4 to give reddish brown vapours However, B reacts only with conc. H_2SO_4 to give similar vapours. Hence A and B are respectively.

1. NaBr, NaNO₃
2. NaNO₃, NaBr
3. NaNO₂, NaBr
4. NaBr, NaNO₂

11. Bromine water reacts with SO_2 to form?

1. H_2O and Hbr
2. $H_2SO_4 + HBr$
3. HBr and S
4. S and H_2O

12. Colloidal sulphur is obtained when

1. Sulphur is treated with H_2SO_4
2. Sulphur is strongly heated
3. Sulphur is strongly heated
4. H_2S gas is passed through dil. HNO_3

13. Conc. H_2SO_4 displaces hydrogen chloride from chlorides because

1. It is strong than hydrochloric acid
2. HCl is a gas while H_2SO_4 is a liquid
3. Sulphates are more soluble than chlorides
4. Sulphates are less soluble than chlorides

14. The oxyacid of phosphorus in which phosphorus has the lowest oxidation state is

- 1) hypophosphorus acid
- 2) orthophosphoric acid
- 3) pyrophosphoric acid
- 4) metaphosphoric acid

15. White phosphorus on reaction with lime water gives calcium salt of an acid (A) along with a gas (X). Which of the following statements is correct with respect to above?

- 1) (A) on heating gives (X) and O_2
- 2) The bond angle in (X) is less than that in case of ammonia
- 3) (A) is a dibasic acid
- 4) (X) is more basic than ammonia

16. The number of lone pairs and the number of S – S bonds in S_8 molecules are respectively

- 1) 8,8
- 2) 16,8
- 3) 8,16
- 4) 8,4

17. An oxide of a non-metal has the following properties:

- (i) It acts both as a proton donor as well as proton acceptor
- (ii) It reacts readily with basic and acidic oxides
- (iii) It oxidizes Fe at its boiling point.

- 1) P_2O_5
- 2) SiO_2
- 3) H_2O
- 4) CO_2

18. Which of the following solutions does not change its color on passing ozone through it?

- a) Starch iodide solution
b) Alcoholic solution of benzidine
c) Acidic solution of $K_2Cr_2O_7$
d) Acidified solution of $FeSO_4$

19. Yellow oils of sulphur is/are

1. H_2S 2. H_2S_1, H_2S_3 3. H_2SO_4 4. CS_2, NH_2CSNH_2

20. $SO_2 + H_2S \rightarrow$ Product the final product is

1. H_2SO_3 2. H_2SO_4 3. $H_2S_2O_3$ 4. $H_2O + S$

21. The number of S – S bonds in sulphur trioxide

1. Three 2. Two 3. One 4. Zero

22. Oleum is

1. Fuming H_2SO_4 2. Oil of vitriol 3. Castor oil 4. Caro's acid

23. Ozone depleted due to formation of

1. Acrolein 2. Chlorine nitrate 3. PAN 4. SO_2 & SO_3

24. S – S bond is present in

1. (a) $\alpha-(SO_3)_n$ 2. $\gamma-(S_3O_9)$ 3. $H_2S_2O_3$ 4. $H_2S_2O_8$

25. Holme's signals can be given by using

1. $CaC_2 + CaCO_3$ 2. $CaC_2 + CaCN_2$ 3. $CaC_2 + Ca_3P_2$ 4. $Ca_3P_2 + CaCN_2$

26. $(NH_4)_2Cr_2O_7$ on heating liberates a gas. The same will be obtained by

1. Heating NH_4NO_3 2. Heating NH_4NO_2
3. Treating N_2O_2 with $NaNO_2$ 4. Treating Mg_3N_2 with H_2O

27. A Student accidentally splashes few drops of conc H_2SO_4 on his cotton shirt, after a while, the splashed parts blacken and holes appear. This is happened because sulphuric acid

1. Dehydrates the cotton with burning
2. Causes the cotton react with burning
3. Heats up the cotton reacts with air
4. Removes the elements of water from cotton

28. When molten sulphur is suddenly cooled by pouring into water, it takes the form of

1. Milk of sulphur
2. Colloidal sulphur
3. Flower of sulphur
4. Plastic sulphur

29. Assertion: Ozone is a powerful oxidizing agent in comparison to O_2 .

Reason: Ozone is diamagnetic but O_2 is paramagnetic.

1. If both assertion and reason are correct, and reason is the correct explanation of the assertion
2. If both assertion and reason are correct, but reason is not the correct explanation of the assertion
3. If assertion is correct but reason is incorrect
4. If assertion is incorrect but reason is correct

30. Assertion: Oxygen is more electronegative than sulphur, yet H_2S is acidic, while H_2O is neutral.

Reason: H – S bond is weaker than O – H bond.

1. If both assertion and reason are correct, and reason is the correct explanation of the assertion
2. If both assertion and reason are correct, but reason is not the correct explanation of the assertion
3. If assertion is correct but reason is incorrect
4. If assertion is incorrect but reason is correct

31. BaO_2 and ozone reacts to produce

1. Ba
2. Ba_2O_3
3. BaO
4. $Ba(OH)_3$

32. The incorrect statement among the following is

1. C_{60} is an allotropic form of carbon
2. O_3 is an allotropic form of oxygen
3. S_8 is only allotropic form of sulphur
4. red phosphorus is more stable in air than white phosphorus.

33. Assertion Molecular nitrogen is less reactive than molecular oxygen

Reason The bond length of N_2 is shorter than that of oxygen

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.

34. The acidity of hydrides of O, S, Se, Te varies in the order

1. $H_2O > H_2S > H_2Se > H_2Te$
2. $H_2O < H_2S < H_2Se < H_2Te$
3. $H_2S > H_2O > H_2Se > H_2Te$
4. $H_2Se > H_2S > H_2O > H_2Te$

35. Catalyst used in making H_2SO_4 in contact process is

1. V_2O_5
2. Fe_2O_3
3. Cr_2O_3
4. CrO_3

36. The molecular formula of dithionic acid is

1. $H_2S_2O_4$
2. $H_2S_2O_6$
3. $H_2S_2O_5$
4. $H_2S_2O_7$

37. Assertion Reaction of SO_2 and H_2S in the presence of Fe_2O_3 catalyst gives elemental sulphur.

Reason SO_2 is reducing agent

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.

38. Fuming sulphuric acid is

1. NH_4NO_3 2. NH_4Cl 3. $(NH_4)_2SO_4$ 4. NH_4OH

39. $H_2S_2O_8$ is

1. pyrosulphuric acid
2. Marshall's acid
3. oleum
4. All of these

40. Which of the following pairs are correctly matched?

1	Haber process	Manufacture of ammonia
2	Leblanc process	Manufacture of sulphuric acid
3	Birkeland-Eyde process	Manufacture of nitric acid
4	Solvay process	Manufacture of sodium carbonate

Select the correct answer using the codes given below.

1. 2 and 3 and 4 2. 1, 2, 3 and 4 3. 1 and 2 4. 1, 3 and 4

41. Consider the following compounds

- 1) Sulphur dioxide 2) Hydrogen peroxide 3) Ozone

Among these compounds identify those that can act as bleaching agent

1. 1 and 3 2. 2 and 3 3. 1 and 2 4. 1,2 and 3

42. The most efficient agent for the absorption of SO_3 is

1. 80% H_2SO_4 2. 98% H_2SO_4 3. 50% H_2SO_4 4. 20% $H_2S_2O_7$

43. Sulphur reacts with chlorine in 1:2 ratio and forms X. Hydrolysis of X gives a sulphur compound Y. What is the hybridisation state of central atom in the anion of Y?

1. sp^3 2. sp 3. sp^2 4. sp^3d

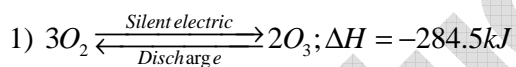
44. The color of liquid O_2 is

1. Red 2. Dark blue 3. Pale yellow 4. Pale blue

45. In the preparation of sulphuric acid, V_2O_5 is used in the reaction which is

1. $S + O_2 \rightarrow SO_2$ 2. $SO_2 + H_2O \rightarrow H_2SO_4$
3. $2SO_2 + O_2 \rightarrow 2SO_3$ 4. None of the above

46. Which of the following is not correct?



- 2) Ozone undergoes addition reaction with saturated carbon compounds
3) Sodium thiosulphate reacts with I_2 to form sodium tetrathionate and sodium iodide.
4) Ozone oxidises lead sulphide to lead sulphate.

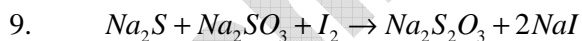
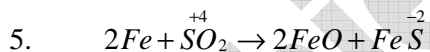
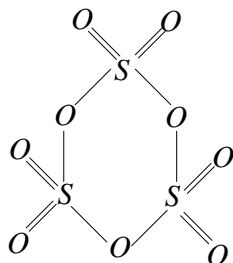
VI A GROUP ELEMENTS

SUB TOPIC-II (KEY)

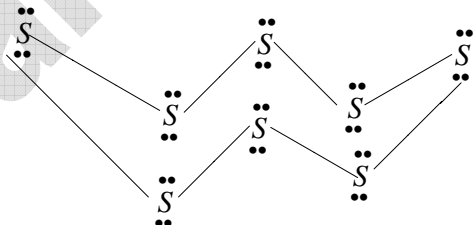
1) 1	2) 2	3) 1	4) 3	5) 2	6) 2	7) 3	8) 3	9) 2	10) 3
11) 2	12) 4	13) 2	14) 1	15) 2	16) 2	17) 3	18) 3	19) 2	20) 4
21) 4	22) 1	23) 2	24) 3	25) 4	26) 2	27) 4	28) 4	29) 2	30) 1
31) 3	32) 3	33) 2	34) 2	35) 1	36) 2	37) 3	38) 1	39) 2	40) 4
41) 4	42) 2	43) 1	44) 4	45) 3	46) 1				

VI A GROUP ELEMENTS SUBTOPIC-II (SOLUTIONS)

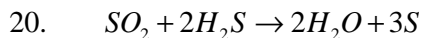
1.



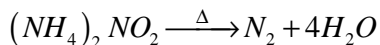
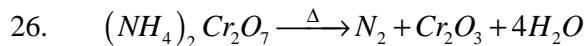
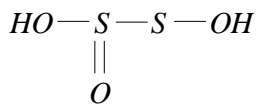
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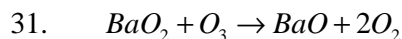
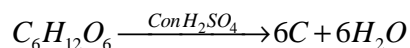
18. Ozone does not react with acidified solution of $K_2Cr_2O_7$. Thus, does not change its colour.



24.



27. Conc H_2SO_4 has dehydration properties, when celles lose comes in contact with conc H_2SO_4 , it removes water from CoHon leaving only black carbon.

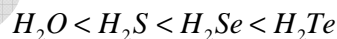


32. There are five allotropic form of sulphur.

- 1) Rhombic, octacheral or α -sulphur. 2) Monoclinic, prismatic or β -sulphur
3) Plastic or γ -sulphur 4) Milk of sulphur 5) Colloidal or δ -sulphur.

33. Molecular nitrogen is less reactive than that of oxygen because nitrogen has high dissociation energy in comparison to oxygen so, its reactivity is less. Also bond length of nitrogen is shorter oxygen because of presence of triple bond between nitrogen atoms. So, both are true but not correct explanation.

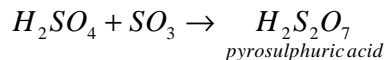
34. The acidic nature increases from H_2O to H_2Te . The increase in acidic character of hydrides on moving down the group may be explained in terms of bond length of H – M bond, larger is bond-length, lesser is is bond energy and thus easier is ionization of H – M bond or easier is proton donor nature. Hence,



35. Even at 400-500⁰C, the rate of reaction is very low. Therefore, to increase the reaction velocity a suitable catalyst is used. Now a days most of the sulphuric acid plants use V_2O_5 as a catalyst.

36. $H_2S_2O_4$ - Dithionous acid
 $H_2S_2O_6$ - Dithionic acid
 $H_2S_2O_5$ - Disulphurous acid
 $H_2S_2O_7$ - Disulphuric acid

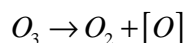
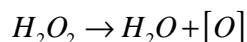
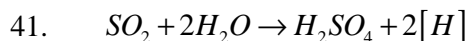
38. Fuming sulphuric acid is oleum ($H_2S_2O_7$).



SO_3 is absorbed in concentrated H_2SO_4 to give oleum

39. $H_2S_2O_8$ is peroxodisulphuric acid. It is also called Marshall's acid.

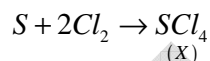
40. Leblanc process is used in the manufacture of sodium carbonate.



The nascent [H] and [O] thus product, bleaches the coloured articles.

42. 98% H_2SO_4 is used for absorbing dense form of acid which is formed by dissolving SO_3 in water. Hence, 98% H_2SO_4 is the most efficient reagent for absorption of SO_3 .

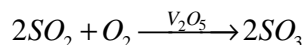
43. When sulphur reacts with chlorine in 1:2 ratio the SCl_4 (sulphur tetra chloride) is obtained which on hydrolysis gives sulphurous acid (H_2SO_3). So, the compound X is SCl_4 and Y is H_2SO_3



The hybridisation of sulphur in SO_3^{2-} is sp^3 .

44. Oxygen changes into pale blue liquid when cooled up to $-183^\circ C$. Liquid oxygen is used as oxidizer in rockets and the launching of satellites.

45. In contact process of manufacture of H_2SO_4 first of all SO_2 is oxidised to SO_3 by atmospheric oxygen in presence of V_2O_5 as a catalyst.



46. The formation of ozone from oxygen is an endothermic reaction, not exothermic reaction.

