CHEMISTRY

BOOKS - CENGAGE CHEMISTRY (HINGLISH)

P-BLOCK GROUP 16 ELEMENTS - THE OXYGEN FAMILY

Illustration

1. Reducing property of dioxides decreases from SO_2 to TeO_2. Why ?

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2. (a) Elements of group 16 generally show lower value of first ionisation enthalpy as compared to the corresponding periods of group 15. Why ?

(b) H_2S is less than acidic than H_2Te. Why ?

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3. The correct order of relative basic character of $NaOH$, $Mg(OH)_2$ and $Al(OH)_3$ is

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4. Which of the oxdies behave both as neutral oxide and suboxide ?

(a) N_2O , b. NO, c. C_3O_2 , d. CO

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5. Which of the following is not amphoteric oxide ?

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6. Which of the following is superoxide ?

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7. Which of the oxides is coloured and contains $3e^-$ bond ?

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8. (a) Which form of sulphur shows paramagnetic behaviour ?

(b) Compounds of fluorine and oxygen are called fluorides and not oxides. Explain.

(c) Sulphur disappears when boiled with an aqueous solution of sodium sulphite. Why ?

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9. Knowing the electron gain enthalpy values for $O \rightarrow O^{\ominus}$ and $O \rightarrow O^{2-}$ as $-141 kJ mol^{-1}$ and $+702 kJ mol^{-1}$ respectively, how can you account for the formation of a large number of oxides having O^{2-} species and not $O^{\ominus}$?

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10. What happens when

(i) Concentrated H_2SO_4 is added to calcium fluoride.

(ii) SO_3 is passed through water ?

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11. Give at least one example to explain the following properties.

(a) Sulphuric acid is a dibasic acid.

(b) Sulphuric acid is a dehydrating agent.

(c) Sulphuric acid is an oxidising agent.

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12. How will you obtain the following from sulphuric acid ?

(a) SO_2

(b) SO_2

(c) SO_2Cl_2.

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13. Give reason for the following :

(a) $Conc.\ H_2SO_4$ cannot be used for drying H_2.

(b) $KMnO_4$ should not be dissolved in $conc.\ H_2SO_4$.

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Solved Example

1. State with balanced equation what happens when ?

(a) Potassium ferrocyanide is heated with $conc.\ H_2SO_4$.

(b) A mixture of potassium chlorate, oxalic acid and sulphuric acid is heated.

(c) Sodium chlorate reacts with sulphur dioxide.

(d) Chlorine gas is passed into water saturated with hydorgen sulphide.

(e) Hydrogen sulphide is passed through sodium bisulphite solution.

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2. When gas A is passed through dry KOH at low temperature, a deep red coloured compound, B and a gas care obtained. The gas A, on reaction with but-2-ene,

followed by treatment with Zn/H_2O yields acetaldehyde. Identify A, B and C.

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3. (a) Sulphur melts form a clear mobile liquid at $199^\circ C$ but on further heating to $180^\circ C$, it becomes viscous. Why ?

(b) $SOCl_2$ can act as a weak Lewis acid as well as a weak Lewis base. Explain.

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4. Concentrated H_2SO_4 is added to the test tubes containing (a) to (e).

Test tube	Compounds
$a.$	Cane sugar
$b.$	sodium bromide
$c.$	Copper turnings
$d.$	Sulphur powder
$e.$	Potassium chloride

Identify in which of the above test tubes, the following change will be observed on heating. Also give the chemical equations involved.

(i) Formation of black substance.

(ii) Evolution of brown gas.

(iii) Evolution of colourless gas.

(iv) Formation of brown substance, which on dilution becomes blue.

(v) Disappearance of yellow powder along with the evolution of a colourless gas.

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5. A pale yellow substance (A) when heated with $conc.\ HNO_3$ evolves a brown coloured 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 smelled gas (D) which is formed by the substance (A) in air. The solution (c) decolourises iodine solution, Identify (A) to (D).

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Ex 3 1 Subjective Give Reason

1. Oxygen exists as a gas, while sulphur exists as a solid Why ?

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2. H_2O is a liquid while H_2S is a gas.

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3. Oxygen almost variably and oxidation state of -2 but the other members of family exhibit negative as well as positive oxidation states of $+2,\ +4$ and $+6$. Explain.

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4. Down the group $(\downarrow)$ i.e. from S to Po, tendency to show -2 oxidation state diminishes. Why ?

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5. Why dry SO_2 cannot bleach dry flowers ?

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6. Why $conc.\ H_2SO_4$ cannot be used to dry hydrogen sulphide ?

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7. Why in the manufacture of H_2SO_4 by contact process, sulphur trioxide is not directly dissolved in water ?

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8. Sulphuric acid has high boiling point and viscosity. Why ?

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9. An aqueous solution of a gas (X) gives the following reactions :

(a) It decolourises an acidified $K_2Cr_2O_7$ solution.

(b) On boiling with H_2O_2, cooling it and then adding an aqueous solution of $BaCl_2$, a precipitate insoluble in *conc.* HCl is obtained.

(c) On passing H_2S in the solution, white turbidity is obtained.

Identify (X) and give equations for steps (a), (b) and (c).

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10. An inorganic halide (A) reacts with water to form two acids (B) and (c). (A) also reacts with $NaOH$ to form two salts (D) and (E) which remain in solution. The solution gives white precipitate with both $AgNO_3$ and $BaCl_2$ solutions respectively. (A) is a useful organic reagent. Identify (A) to (E).

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11. Name the following compounds :

Oxides of sulphur :

(i) S_2O

(ii) S_2O_3

(iii) SO_4

(iv) S_2O_7.

(b) Oxyacids of sulphur :

(i) H_2SO_2

(ii) H_2SO_3

(iii) $H_2S_2O_4$

(iv) $H_2S_2O_2$

(v) $H_2S_2O_5$.

(c) Sulphuric acid : (i) $H_2S_2O_3$

(ii) $H_2S_2O_7$

(d) Thionic acids : (i) $H_2S_2O_6$

(ii) $H_2(S)_nO_6$

(e) Peroxo acids : (i) H_2SO_5

(ii) $H_2S_2O_8$.

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12. Explain the following :

(a) An acidified $K_2Cr_2O_7$ paper turns green when exposed to SO_2.

(b) H_2S acts only as reducing agent while SO_2 can act both as a reducing agent and an oxidising agent.

(c) SO_2 acts as a bleaching agent.

(d) Sugar turns black on addition of conc. H_2SO_4.

(e) Ozone destroys mercury meniscus.

(f) SF_6 is known, but SH_6 is not known.

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13. What happens when :

(a) Ozone is passed through acidified stannous chloride solution.

(b) Potassium iodide is heated with $conc.\ H_2SO_4$.

(c) Sulphur is boiled with caustic soda solution.

(d) Ozone reacts with potassium ferrocyanide solution.

(e) Ozone is treated with ethylene.

(f) Sulphur dioxide is bubbled through aqueous solution of copper sulphate in presence of potassium thiocyanate.

(g) Sulphur dioxide gas, water vapour and air are passsed over heated sodium chloride.

(h) Sulphuric acid is treated with PCl_5.

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14. When sulphur is boiled is boiled with Na_2SO_3, a compound (X) is produced, (X) with excess of $AgNO_3$ solution gives a compound (Y) which is soluble in water

and produces a black coloured sulphide (Z). Identify compounds (X), (Y) and (Z).

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Ex 3 1 Objective Choose The Correct Option

1. An organic acid (A) reacts with concentrated H_2SO_4 to give a neutral oxide (B), acidic oxide (c) and a diatomic oxide (D). When (D) reacts with chlorine gas, a poisonous gas (E) is evolved. This gas with ammonia gives an organic compound (F). The compound (A) and (F) are.

A. $(A) = H_2C_2O_4$ and NH_2CONH_2

B. $(A) = CH_3COOH$ and $(F) = NH_2CONH_2$.

C. $(A) = CHCl_3$ and $(F) = H_2C_2O_4$

D. $(A) = CCl_4$ and $(F) = CH_3CHO$.

Answer: A

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2. Componds (A) and B are treated with dilute HCl separately. The gases liberated are Y and Z respectively. Y turns acidified $K_2Cr_2O_7$ paper green while Z turns lead acetate paper black. The compounds A and B are respectively :

A. Na_2S and Na_2SO_3

B. Na_2SO_3 and Na_2S

C. $NaCl$ and Na_2CO_3

D. Na_2SO_3 and Na_2SO_4

Answer: B

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3. A yellow coloured crystalline substance gave a colourless gas X on reaction with fluorine, which is thermally stable and has octahedral geometry. X can be

A. SF_4

B. S_2F_2

C. SF_6

D. S_2F_6

Answer: C

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4. A green coloured solution of a salt changes its colour to light pink on passing ozone through it. Which of the following species represent pink and green colour respectively.

A. Mn^{2+} and MnO_2

B. $MnO_4^{\ominus}$ and MnO_4^{2-}

C. Co^{2+} and Co^{3+}

D. MnO_4^{2-} and $MnO_4^{\ominus}$

Answer: D

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5. Which concentrated H_2SO_4 can be used to dry the gas ?

A. H_2S

B. CO_2

C. NH_3

D. All

Answer: B

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6. Sulphur on reaction with concentrated HNO_3. Gives (A) which reacts with reacts with $NaOH$ gives (B). (A) and

(B) are

A. H_2SO_3, $Na_2S_2O_3$

B. NO_2, Na_2S

C. H_2SO_4, Na_2SO_4

D. $H_2S_2O_3$, $Na_2S_2O_3$

Answer: C

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7. The formation of which of the substance is known as tailing of mercury ?

A. Hg_2O

B. HgO

C. $Hg(NO_3)_2$

D. HgS

Answer: A

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8. Which of the following elements form $p\pi - d\pi$ bonding in its oxide ?

A. Lithium

B. Boron

C. Sulphur

D. Nitrogen

Answer: C

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9. In which of the following species, S-atom assumes sp^3 hybrid state ?

(I) (SO_3) ,

(II) (SO_2) ,

(III) (H_2S) ,

(IV) (S_8).

A. I, II

B. II, III

C. II, IV

D. III, IV

Answer: D

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10. Which of the following reaction depicts the oxidsing behaviour of H_2SO_4?

A. $2HI + H_2SO_4 \rightarrow I_2 + SO_2 + 2H_2O$

B. $Ca(OH)_2 + H_2SO_4 \rightarrow CaSO_4 + 2H_2O$

C. $NaCl + H_2SO_4 \rightarrow NaHSO_2 + HCl$

D. $2PCl_5 + H_2SO_4 \rightarrow 2POCl_3 + 2HCl + SO_2Cl_2$

Answer: A

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11. Complete the following equations :

(i)

$(NH_4)_2S_2O_8 + H_2O + MnSO_4 \rightarrow \ldots\ldots + \ldots\ldots + \ldots.$

(ii) $S + H_2SO_4(conc,) \xrightarrow{Heat} \ldots\ldots + H_2O$

(iii) $I_2 + SO_2 + H_2O \rightarrow SO_4^{2-} + \ldots\ldots + H^{\oplus}$

(iv) $I_2 + O_3 + H_2O \rightarrow HIO_3 + \ldots\ldots$

(v) $Cr_2O_7^{2-} + H^{\oplus} + SO_2 \rightarrow SO_2^{2-} + H_2O + \ldots\ldots$

(vi) $H_2S + HNO_3 \rightarrow \ldots. + H_2O + S.$

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Exercises Linked Comprehension

1. H_2SO_4 is the most important acid used in the chemical industry. Concentrated H_2SO_4 has quite strong oxidising

properties.

H_2SO_4 acts as.

A. Reducing agent

B. Oxidising agent

C. Only monobasic acid

D. None of these

Answer: B

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2. H_2SO_4 is the most important acid used in the chemical industry. Concentrated H_2SO_4 has quite strong oxidising properties.

The shape of H_2SO_4 is

A. Tetrahedral

B. Pyramidal

C. Plannar

D. T-shaped

Answer: A

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3. H_2SO_4 is the most important acid used in the chemical industry. Concentrated H_2SO_4 has quite strong oxidising properties.

Oxidation state of S in H_2SO_4 is

A. $+6$

B. $+4$

C. $+2$

D. $+3$

Answer: A

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4. Hydrogen peroxide is an important compound of hydrogen and oxygen. It shows various types of properties and chemical reactions.

Hydrogen peroxide is not

A. A reducing agent

B. An oxidising agent

C. A dehydrating agent

D. A bleaching agent

Answer: C

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5. Hydrogen peroxide is an important compound of hydrogen and oxygen. It shows various types of properties and chemical reactions.

The reaction $H_2S + H_2O_2 \rightarrow S + 2H_2O$ manifests.

A. Acidic nature of H_2O_2

B. Alkaline nature of H_2O_2

C. Oxidising action of H_2O_2

D. Reducing nature of H_2O_2

Answer: A

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6. Hydrogen peroxide is an important compound of hydrogen and oxygen. It shows various types of properties and chemical reactions.

The species that do not contain peroxide ion $(s)is/are.$

A. PbO_2

B. SrO_2

C. Na_2O_2

D. BaO_2

Answer: A

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7. Hydrogen peroxide is an important compound of hydrogen and oxygen. It shows various types of properties and chemical reactions.

The oxidation state of oxygen in H_2O_2 is.

A. $+1$

B. -1

C. $+2$

D. -2

Answer: B

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8. Sulphuric acid is considered as the king of chemicals. The prosperity of any country is measured by the amount of sulphuric acid it consumes. Sulphuric acid is, thus, a substance of very great commercial importance as it used practically ine every important industry. This is due to the following properties of sulphuric acid :

(a) acidic nature

(b) oxidising nature

(c) dehydrating nature

(d) sulphonation.

Sulphuric acid has very corresive action on skin because

A. It reacts with proteins

B. It acts as an oxidising agent

C. It acts as a dehydrating agent

D. It acts as a dehydrating agent and absorption of water is highly exothermic.

Answer: D

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(a) acidic nature

(b) oxidising nature

(c) dehydrating nature

(d) sulphonation.

Which of the following reactions depict the oxidising behaviour of H_2SO_4 ?

A. $2HI + H_2SO_4 \rightarrow I_2 + SO_2 + 2H_2O$

B. $NaCl + H_2SO_4 \rightarrow NaHSO_4 + HCl$

C. $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

D. $2PCl_5 + H_2SO_4 \rightarrow 2POCl_3 + 2HCl + SO_2Cl_2$

Answer: A

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10. Sulphuric acid is considered as the king of chemicals. The prosperity of any country is measured by the amount of sulphuric acid it consumes. Sulphuric acid is, thus, a substance of very great commercial importance as it used practically ine every important industry. This is due to the following properties of sulphuric acid :

(a) acidic nature

(b) oxidising nature

(c) dehydrating nature

(d) sulphonation.

Sulphuric acid is used.

A. In lead storage batteries

B. In making fertilizers

C. In making explosives

D. All of these

Answer: D

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11. Sulphuric acid is considered as the king of chemicals. The prosperity of any country is measured by the amount of sulphuric acid it consumes. Sulphuric acid is, thus, a substance of very great commercial importance as it used practically ine every important industry. This is due to the following properties of sulphuric acid :

(a) acidic nature

(b) oxidising nature

(c) dehydrating nature

(d) sulphonation.

Concentrated H_2SO_4 cannot be used to prepare HBr or HI from KBr or KI because it.

A. Reacts too slowly with KBr or KI.

B. Reducing HBr or HI

C. Oxidising HBr or HI

D. Oxidises KBr or $KBrO_3$ or KI to KIO_3

Answer: C

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12. Sulphuric acid is considered as the king of chemicals. The prosperity of any country is measured by the amount of sulphuric acid it consumes. Sulphuric acid is, thus, a substance of very great commercial importance as it used

practically ine every important industry. This is due to the following properties of sulphuric acid :

(a) acidic nature

(b) oxidising nature

(c) dehydrating nature

(d) sulphonation.

only carbon is obtained when concentrated H_2SO_4 is added to

A. Formic acid

B. Cane sugar

C. Oxalic acid

D. Ethyl alcohol

Answer: B

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13. Sulphuric acid is considered as the king of chemicals. The prosperity of any country is measured by the amount of sulphuric acid it consumes. Sulphuric acid is, thus, a substance of very great commercial importance as it used practically ine every important industry. This is due to the following properties of sulphuric acid :

(a) acidic nature

(b) oxidising nature

(c) dehydrating nature

(d) sulphonation.

The formation of nitroglycerine is done by the use of concentrated nitric acid and concentrated sulphuric acid. The process of conversion of glycerine into nitroglycerine is termed as.

A. Sulphonation

B. Oxidation

C. Nitration

D. Dehydration

Answer: C

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14. The binary compounds of oxygen with other elements are called oxides. They are classified depending either upon their acid-base characteristics or on the basis of oxygen content.

(a) Normal oxides : These oxides which contain oxygen atom as permitted by the normal oxidation number, i.e., -2 normal oxide may be acidic, basic, amphoteric or neutral.

(b) Polyoxides : The oxides which contain oxygen atoms different than those permitted by the normal oxidation number of -2.

(i) Peroxides : Two oxygen atoms are linked to each other and oxyegen has -1 oxidation number. They contain $(O-O)^{2-}$ unit.

(ii) Superoxodes : These oxides contain $(O-O)^{-1}$ unit, i.e., each O-atom has oxidation number $-1/2$.

(c) Suboxides : These contain low content of oxygen than expected.

(d) Mixed oxides : These oxides are made of two simpler oxides.

Which pair of species is referred to as suboxides ?

A. CO, NO

B. SO_2, CaO

C. N_2O, CO

D. N_2P, C_3O_2

Answer: D

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15. The binary compounds of oxygen with other elements are called oxides. They are classified depending either upon their acid-base characteristics or on the basis of oxygen content.

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(b) Polyoxides : The oxides which contain oxygen atoms different than those permitted by the normal oxidation number of -2.

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(c) Suboxides : These contain low content of oxygen than expected.

(d) Mixed oxides : These oxides are made of two simpler oxides.

Which of the following pairs contains neutral oxides ?

A. SO_2, SO_3

B. N_2O_3, N_2O_5

C. CO, NO

D. Na_2O, CaO

Answer: C

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16. The binary compounds of oxygen with other elements are called oxides. They are classified depending either upon their acid-base characteristics or on the basis of oxygen content.

(a) Normal oxides : These oxides which contain oxygen atom as permitted by the normal oxidation number, i.e., -2 normal oxide may be acidic, basic, amphoteric or neutral.

(b) Polyoxides : The oxides which contain oxygen atoms different than those permitted by the normal oxidation number of -2.

(i) Peroxides : Two oxygen atoms are linked to each other and oxyegen has -1 oxidation number. They contain

$(O-O)^{2-}$ unit.

(ii) Superoxodes : These oxides contain $(O-O)^{-1}$ unit, i.e., each O-atom has oxidation number $-1/2$.

(c) Suboxides : These contain low content of oxygen than expected.

(d) Mixed oxides : These oxides are made of two simpler oxides.

Which of the following pairs contains mixed oxides ?

A. Pb_3O_4, Fe_3O_4

B. MnO_2, BaO_2

C. KO_2, Na_2O_2

D. Mn_3O_4, N_2O_5

Answer: A

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17. The binary compounds of oxygen with other elements are called oxides. They are classified depending either upon their acid-base characteristics or on the basis of oxygen content.

(a) Normal oxides : These oxides which contain oxygen atom as permitted by the normal oxidation number, i.e., -2 normal oxide may be acidic, basic, amphoteric or neutral.

(b) Polyoxides : The oxides which contain oxygen atoms different than those permitted by the normal oxidation number of -2.

(i) Peroxides : Two oxygen atoms are linked to each other and oxyegen has -1 oxidation number. They contain $(O-O)^{2-}$ unit.

(ii) Superoxodes : These oxides contain $(O-O)^{-1}$ unit, i.e., each O-atom has oxidation number $-1/2$.

(c) Suboxides : These contain low content of oxygen than expected.

(d) Mixed oxides : These oxides are made of two simpler oxides.

Which of the following pairs contains amphoteric oxides ?

A. BeO, BaO

B. BeO, Al_2O_3

C. Al_2O_3, P_2O_5

D. FeO, CuO

Answer: B

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18. The binary compounds of oxygen with other elements are called oxides. They are classified depending either upon their acid-base characteristics or on the basis of oxygen content.

(a) Normal oxides : These oxides which contain oxygen atom as permitted by the normal oxidation number, i.e., -2 normal oxide may be acidic, basic, amphoteric or neutral.

(b) Polyoxides : The oxides which contain oxygen atoms different than those permitted by the normal oxidation number of -2.

(i) Peroxides : Two oxygen atoms are linked to each other and oxyegen has -1 oxidation number. They contain $(O-O)^{2-}$ unit.

(ii) Superoxodes : These oxides contain $(O-O)^{-1}$ unit, i.e., each O-atom has oxidation number $-1/2$.

(c) Suboxides : These contain low content of oxygen than

expected.

(d) Mixed oxides : These oxides are made of two simpler oxides.

Which of the following oxides is paramagnetic in nature ?

A. KO_2

B. BaO_2

C. H_2O

D. CO_2

Answer: A

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19. Sulphur and rest of the elements of group 16 are less electronegative than oxygen, Therefore, their atoms cannot

take electrons easily. They can acquire ns^2np^6 configuration by sharing two electrons with the atoms of other elements and thus, exhibit $+2$ oxidation state in their compounds. In addition to this, their atoms have vacant d-orbitals in their valence shell to which electrons can be promoted from the p and s-orbitals of the same shell. As a result, they can show $+4$ and $+6$ oxidation states.

The oxidation state of of sulphur in S_8, SO_3 and H_2S respectively are.

A. $0,\ +6,\ -2$

B. $+2,\ +6,\ -2$

C. $0,\ +4+2$

D. $-2,\ +6,\ +2$

Answer: A

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20. Sulphur and rest of the elements of group 16 are less electronegative than oxygen, Therefore, their atoms cannot take electrons easily. They can acquire ns^2np^6 configuration by sharing two electrons with the atoms of other elements and thus, exhibit $+2$ oxidation state in their compounds. In addition to this, their atoms have vacant d-orbitals in their valence shell to which electrons can be promoted from the p and s-orbitals of the same shell. As a result, they can show $+4$ and $+6$ oxidation states.

The oxidation state of sulphur in $Na_2S_4O_6$ is

A. $2/3$

B. $3/2$

C. $3/5$

D. $5/2$

Answer: D

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21. Sulphur and rest of the elements of group 16 are less electronegative than oxygen, Therefore, their atoms cannot take electrons easily. They can acquire ns^2np^6 configuration by sharing two electrons with the atoms of other elements and thus, exhibit $+2$ oxidation state in their compounds. In addition to this, their atoms have vacant d-orbitals in their valence shell to which electrons can be promoted from the p and s-orbitals of the same shell. As a result, they can show $+4$ and $+6$ oxidation states.

The nature of the compounds of sulphur having $+4$ oxidation state is

A. Act as oxidising agents

B. Acts as reducing agents

C. Act as oxidising as well as reducing agents

D. Cannot be predicted

Answer: C

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22. Sulphur and rest of the elements of group 16 are less electronegative than oxygen, Therefore, their atoms cannot take electrons easily. They can acquire ns^2np^6 configuration by sharing two electrons with the atoms of other elements

and thus, exhibit $+2$ oxidation state in their compounds. In addition to this, their atoms have vacant d-orbitals in their valence shell to which electrons can be promoted from the p and s-orbitals of the same shell. As a result, they can show $+4$ and $+6$ oxidation states.

Like sulphur, oxygen does not show $+4$ and $+6$ oxidation states. The reason is

A. That oxygen is a gas while sulphur is a solid

B. That oxygen has high ionisatio enthalpies in comparison to sulphur

C. That oxygen has high electron affinity in comparison to sulphur

D. That oxygen has no d-orbitals in its valence shell.

Answer: D

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23. Sulphur and rest of the elements of group 16 are less electronegative than oxygen, Therefore, their atoms cannot take electrons easily. They can acquire ns^2np^6 configuration by sharing two electrons with the atoms of other elements and thus, exhibit $+2$ oxidation state in their compounds. In addition to this, their atoms have vacant d-orbitals in their valence shell to which electrons can be promoted from the p and s-orbitals of the same shell. As a result, they can show $+4$ and $+6$ oxidation states.

Oxygen exhibits $+2$ oxidation state in

A. H_2O

B. OF_2

C. Cl_2O

D. H_2O_2

Answer: B

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Exercises Multiple Correct

1. Oxygen has -1 oxidation state in the compound.

A. Caro's acid

B. Marshall's acid

C. BaO_2

D. K_2O

Answer: A:B:C

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2. Oxygen has -2 oxidation state in the compound

A. MgO

B. F_2O

C. Na_2O

D. H_2O_2

Answer: A::C

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3. Solid SeO_3 (selenium trioxide) and TeO_3 exist respectively as

A. Cyclic trimer

B. Cyclic tetramer

C. Chain structure

D. Three dimensional net work structure.

Answer: B::D

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4. Which among the following are peroxo acid of sulphur ?

A. H_2SO_3

B. H_2SO_5

C. $H_2S_2O_8$

D. H_2SO_4

Answer: B:C

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5. Select the correct statements about oxygen molecule.

A. It is paramagnetic

B. Its bond order is two

C. Its liquid state it is colourless

D. It has two unpaired electrons

Answer: A::B::D

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6. SO_2 acts as

A. Bleaching agent

B. Oxidising agent

C. Reducing agent

D. Dehydrating agent

Answer: A::B::C

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7. Sulphuric acid can be used as.

A. Hydroscopic agent

B. Oxidising agent

C. Sulphonating agent

D. Effloresecent

Answer: A::B::C

Watch Video Solution

8. SF_6 and SF_4 involves hybridisation of the type ___ and ___ respectively.

A. sp^3

B. sp^3d

C. sp^3d^2

D. sp^2

Answer: B::C

Watch Video Solution

9. Select the correct statements aboyt $Na_2S_2O_3.\ 5H_2O.$

A. It is called as hypo

B. It is used in photography to form complex with $AgBr$

C. It can be used as antichlor

D. It is used to remove stains of I_2.

Answer: A::B::C::D

Watch Video Solution

10. Which of the following are amphoteric ?

A. BeO

B. Al_2O_3

C. ZnO

D. SO_2

Answer: A::B::C

Watch Video Solution

11. Which reagent does not give oxygen as one of the products during oxidation with ozone ?

A. SO_2

B. $SnCl_1 / HCl$

C. H_2S

D. PbS

Answer: A::B

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12. In which of the following $S - S$ link is present ?

A. Caro's acid

B. Dithionic acid

C. Thiosulphuric acid

D. Chlorosulphonic acid

Answer: B::C

Watch Video Solution

13. Sulphur is sp^2 hybridised in

A. SO_3

B. SO_2

C. CO_2

D. CO

Answer: A::B

Watch Video Solution

14. In its compounds, oxygen can show oxidation state (s) of

A. -1

B. -2

C. $+1$

D. $+2$

Answer: A::B::D

Watch Video Solution

Exercises Single Correct

1. The crown structure is possessed by

A. Phosphorous

B. Cyclo-octaring of sulphur

C. Cyclic trimer of SO_3

D. Cyclic tetrameric form of SeO_3

Answer: B

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2. Which one of the following has the highest bond energy ?

A. $O - O$

B. $S - S$

C. $Se - Se$

D. $Te - Te$

Answer: B

Watch Video Solution

3. Which one has the highest and lowest boiling point ?

A. H_2O, H_2S

B. H_2O, H_2Se

C. H_2S, H_2O

D. H_2S, H_2Se

Answer: A

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4. Which one of the following is strongest acid ?

A. H_2S

B. H_2Se

C. H_2O

D. H_2Te

Answer: D

Watch Video Solution

5. Which one has the lowest boiling point ?

A. H_2O

B. H_2S

C. H_2Se

D. KNO_3

Answer: B

Watch Video Solution

6. Anomalous behaviour of oxygen is due to

A. It is highly electronegative

B. Small atomic size

C. Non-availability of d-orbitals

D. All

Answer: D

Watch Video Solution

7. Which of the following is chalcogen ?

A. O

B. S

C. Se

D. All

Answer: D

Watch Video Solution

8. Which of the following componds does not evolve oxygen when heated alone ?

A. $KClO_3$

B. $KMnO_4$

C. NH_4NO_2

D. KNO_3

Answer: C

Watch Video Solution

9. Which show maximum catenation property ?

A. Se

B. Te

C. Po

D. S

Answer: D

Watch Video Solution

10. SO_2 and So_3 involve hybridisation of the type

A. Both sp^2

B. Both sp^3

C. sp^2, sp^3

D. sp^3, sp^2

Answer: A

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11. Basicity of sulphurous acid and sulphuric acid are

A. $2, 2$

B. $1, 2$

C. $2, 1$

D. $1, 1$

Answer: A

Watch Video Solution

12. When oxygen is passed through a solution of Na_2SO_3, we get

A. Na_2S

B. Na_2SO_4

C. $NaHSO_4$

D. NaH

Answer: B

Watch Video Solution

13. Which has greater reactivity

A. $TeCl_6$

B. SF_6

C. TeF_6

D. SeF_6

Answer: B

Watch Video Solution

14. Sulphate ion is ____geomerty

A. Pyramidal

B. Tetrahedral

C. Square planar

D. See-saw

Answer: B

Watch Video Solution

15. Structure of $TeCl_4$ is

A. Octahedral

B. Square planar

C. Trigonal bipyramidal

D. Tetrahedral

Answer: C

Watch Video Solution

16. Which of the following is not known ?

A. SF_6

B. SCl_6

C. SF_4

D. SCl_4

Answer: B

Watch Video Solution

17. SO_3 exists in

A. 3 forms

B. 2 forms

C. 4 forms

D. Only one

Answer: A

Watch Video Solution

18. H_2SO_3 and H_2SO_4 involve hybridisation of the type

A. Both sp^3

B. Both sp^3d

C. sp^3, sp^3d

D. Both dsp^2

Answer: A

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19. Calalyst used in contact process is

A. Platinised asbestos (Badiche process)

B. Vanadium pentaoxide

C. Finely divided platinum deposited on magnesium sulphate (Grillo process)

D. All

Answer: D

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20. In contact process inpurities of arsenic is removed by

A. $Al(OH)_3$

B. Gelatious $Fe(OH)_3$

C. $Cr(OH)_3$

D. Fe_2O_3

Answer: B

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21. Sulphuric acid has great affinity for water because it

A. Decomposes water

B. Forms hydrate with water

C. Hydrolyse the acid

D. Decomposes the acid

Answer: B

Watch Video Solution

22. High density arid low volatility of H_2SO_4 is due to

A. Strong bonds

B. van der Waals force

C. Hydrogen bonding

D. None

Answer: C

Watch Video Solution

23. Conc. H_2SO_4 is not a

A. Dehydration agent

B. Hygroscopic

C. Oxidising agent

D. Efflorescent

Answer: D

Watch Video Solution

24. In the following reaction, H_2SO_4 acts as

$HCOOH \xrightarrow{H_2SO_4} CO + H_2O.$

A. Dehydrating agent

B. Oxidising agent

C. Reducing agent

D. All

Answer: A

Watch Video Solution

25. Oxalic acid when heated with $conc.$ H_2SO_4 it gives out

A. H_2O and CO_2

B. Oxalic sulphate

C. CO_2 and H_2S

D. CO and CO_2

Answer: D

Watch Video Solution

26. In the following reaction, H_2SO_4 acts as

$2Ag + H_2SO_5 \rightarrow Ag_2SO_4 + 2H_2O + SO_2.$

A. Reducing agent

B. Oxidising agent

C. Catalytic agent

D. Dehydration agent

Answer: B

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27. A boy accidently splashes a few drops of $conc.\ H_2SO_4$ on his cotton shirt and splashed part blackens and holes appears. This is because the sulphuric acid

A. Heats up the cotton so that it burns

B. Dehydrates the cotton

C. Causes the cotton to react with oxygen in air

D. Removes the elements of water from cotton.

Answer: D

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28. Various impurities present in contact process are sulphur or pyrite dust, arsenious oxide arid sulphuric acid fog. They

poison the catalyst. Dust impurities are removed in dusting tower by

A. By blowing steam to make dust particle

B. By cottrell precipitators

C. By cooling the gases

D. All

Answer: D

Watch Video Solution

29. Hypo is used in photography because of its

A. Complexing ability

B. Solubility in water

C. Reducing behaviour

D. Sensitivity to light

Answer: A

Watch Video Solution

30. In dry batteries the depolariser is

A. HgO

B. MnO_2

C. NH_4Cl

D. ZnO

Answer: B

Watch Video Solution

31. Caro's and Marshall'a acid does not react with

A. S

B. $KMnO_4$

C. KI

D. H_2O

Answer: B

Watch Video Solution

32. Sulphur dioxide is obtained by the action of dilute H_2SO_4 on :

A. Copper turning

B. Sodium sulphate

C. Sodium sulphite

D. Sodium sulphide

Answer: C

Watch Video Solution

33. Moist iodine reacts with ozone to form.

A. HI

B. I_2O_5

C. HIO_3

D. HIO_4

Answer: C

Watch Video Solution

34. The ratio of the gases obtained on dehydration of $HCOOH$ and $H_2C_2O_4$ by $conc.\ H_2SO_4$ is

A. $2:1$

B. $1:2$

C. $3:1$

D. $1:3$

Answer: B

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35. The product A in the following reaction :

$2KMnO_4 \rightarrow A + KMnO_2 + O_2$ is

A. $K_2Mn_2O_7$

B. K_2MnO_4

C. K_2O

D. K_2O_2

Answer: B

Watch Video Solution

36. The gases respectively absorbed by alkaline pyrogallon and oil of cinnamon is.

A. O_3, CH_4

B. SO_2, CH_4

C. O_2, O_3

D. N_2O, O_3

Answer: C

Watch Video Solution

37. Ordinary oxygen contains.

A. A mixture of O^{16}, O^{17} and O^{18}

B. A mixture of O^{16} and O^{17}

C. Only O^{16}

D. Only O^{18}

Answer: A

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38. Anhydride of sulphuric acid is

A. SO_2

B. SO_3

C. $H_2S_2O_3$

D. H_2SO_3

Answer: B

Watch Video Solution

39. Sulphuric acid is a dibasic acid in nature, hence it forms

A. Acidic salt

B. Acidic and basic salt

C. Acidic and normal salt

D. Double salt

Answer: C

Watch Video Solution

40. When SO_2 is passed through a solution of H_2S in water

:

A. Sulphuric acid is formed

B. A clear solution is formed

C. Sulphur acid is precipitated

D. No change is observed

Answer: C

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41. A considerable part of the harmful ultraviolet radiation of the sun does not reach the surface of earth. This is because in the upper atmosphere, there is a layer of

A. O_3

B. CO_2

C. NH_3

D. H_2

Answer: A

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42. SF_6 is unreactive towards water because

A. Sulphur has very small size

B. Fluorine is most electronegative element

C. Sulphur shows $+6$ oxidation state

D. Due to steric hindrance, molecule cannot attack S-atom.

Answer: D

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43. From the following information

$X + H_2SO_4 \rightarrow Y$ (a colourless and irritating gas)

$Y + K_2Cr_2O_7 + H_2SO_4 \rightarrow$ green coloured solution

Identify the pair X and Y.

A. $Cl^{\ominus}$, HCl

B. So_3^{2-}, SO_2

C. S^{2-}, H_2S

D. CO_3^{2-}, CO_2

Answer: B

Watch Video Solution

44. The catalyst used in the manufacture of H_2SO_4 by contact process is.

A. Platinum

B. Ni

C. Fe

D. NO

Answer: A

Watch Video Solution

45. Oleaum is

A. A mixture of $conc.$ H_2SO_4 and oil

B. Sulphuric acid saturated with SO_3

C. A mixture of H_2SO_4 and HNO_3

D. A mixture of H_2SO_4 and HCl.

Answer: B

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46. Ozone reacts with $K_4Fe(CN)_6$ to form

A. Fe_2O_3

B. $Fe(OH)_3$

C. $Fe(OH)_2$

D. $K_3Fe(CN)_6$

Answer: D

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47. Bleaching action of SO_2 is due to

A. Reduction

B. Oxidation

C. Its acidic nature

D. Hydrolysis

Answer: A

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48. Which of the following statements is wrong ?

A. SO_2 dissolves in water and forms sulphurous acid

B. SO_2 acts as a bleaching agent

C. SO_2 has pungent odour

D. SO_2 acts only as oxidising agent

Answer: D

Watch Video Solution

49. About H_2SO_4, which of the following statements is incorrect ?

A. It acts as a reducing agent

B. It acts as an oxidising agent

C. It acts as a dehydrating agent

D. It is highly viscous

Answer: A

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50. Which one of the following is wrong ?

A. Oxygen and sulphur belong to the same group of periodic table

B. Oxygen is a gas while sulphur is solid

C. Both oxygen and sunphur show $+2$, $+4$ and $+6$ oxidation states.

D. H_2S has no hydrogen bonding

Answer: C

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51. Which one of the following is not true peroxide ?

A. PbO_2

B. BaO_2

C. Na_2O_2

D. H_2O_2

Answer: A

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52. Which of the following oxides exists as trigonal planar molecule in gaseous state and a cyclic trimer in the solid state ?

A. SO_2

B. $SeCO_2$

C. SeO_3

D. SO_3

Answer: D

Watch Video Solution

53. Which of the following acts as pickling agent ?

A. HNO_3

B. H_2SO_4

C. HCl

D. HNO_2

Answer: B

Watch Video Solution

54. Non-metals combine with oxygen to form usually

A. Basic oxides

B. Neutral oxides

C. Acidic oxides

D. Amphoteric oxides

Answer: C

Watch Video Solution

55. Which one of the following is an amphoteric oxide ?

A. MnO_2

B. ZnO

C. CaO

D. CO_2

Answer: B

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56. In the upper layers of atmosphere, ozone is formed.

A. By action of electric discharge on oxygen molecules

B. By action of ultraviolet rays on oxygen molecules

C. By action of infrared rays on oxygen molecules

D. Due to sudden drop of pressure.

Answer: B

Watch Video Solution

57. On heating ozone, its volume.

A. Increase to 1.5 times

B. Decreases to half

C. Remain uncharged

D. Becomes double

Answer: A

Watch Video Solution

58. Which requires catalyst ?

A. $S + O_2 \rightarrow SO_2$

B. $2SO_2 + O_2 \rightarrow 2SO_3$

C. $C + O_2 \rightarrow CO_2$

D. All of these

Answer: B

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59. In the reaction,

$$2KI + H_2O + O_3 \rightarrow 2KOH + O_2 + A$$

The compound A is

A. KIO_3

B. I_2O_5

C. HIO_3

D. I_2

Answer: D

Watch Video Solution

60. Sulphur does not exist as S_2 molecule because

A. It is less electroegative

B. It has ability to exhibit catenation

C. It is not able to constitute $p\pi - p\pi$ bond

D. It has the tendency to show variable oxidation states.

Answer: C

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61. Excess of PCl_5 reacts with $conc.\ H_2SO_4$ gives

A. Sulphuryl chloride

B. Sulphurous acid

C. Chlorosulphonic acid

D. Thionyl cloride

Answer: A

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62. The element evolving two different gases on reaction with $conc.\ H_2SO_4$.

A. P

B. C

C. Hg

D. S

Answer: B

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63. Select the incorrect statement about the following :

A. O_3 is used as germicide for purification of air

B. In $O_3, O-O$ bond length is identical with that of molecular oxygen

C. O_3 molecule is angular in shape

D. O_3 is an oxidising agent

Answer: B

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64. The correct order of $O-O$ bond length in O_2, H_2O and O_3.

A. $O_3 > H_2O_2 > O_2$

B. $O_2 > H_2O_2 > O_3$

C. $O_2 > O_3 > H_2O_2$

D. $H_2O_2 > O_3 > O_2$

Answer: D

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65. Which of the following is not correct ?

A. $3O_2 \underset{\text{Discharge}}{\overset{\text{Sileny electric}}{\Longleftrightarrow}} 2O_3, \Delta H = -284.5kJ.$

B. Ozone undergoes addition reaction with unsaturated carbon compounds

C. Sodium thiosulphate reacts with I_2 to form sodium tetrathionate and sodium iodide.

D. Ozone oxidises lead sulphide to lead sulphate

Answer: A

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66. The number of sigma and pi bonds in peroxydisulphuric acid are, respectively.

A. 9 and 4

B. 11 and 4

C. 4 and 8

D. 4 and 9

Answer: B

Watch Video Solution

67. Tailing of mercury test can be used for which of the following gas ?

A. Dioxygen

B. Dihydrogen

C. Dinitrogen

D. Ozone

Answer: D

Watch Video Solution

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

A. Starch iodide solution

B. Alcoholic solidium of benzidine

C. Acidic solution of $FeSO_4$

D. Acidified solution of $K_2Cr_2O_7$

Answer: C

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69. The function of $Fe(OH)_3$ in the contact process is

A. To detect colloidal impurity

B. To remove moisture

C. To remove dust particles

D. To remove arsenic impurity

Answer: D

Watch Video Solution

70. The acid used in lead storage cells is

A. Phosphoric acid

B. Nitric acid

C. Hydrochloric acid

D. Sulphuric acid

Answer: D

Watch Video Solution

71. Hydrolysis of one mole of peroxodisulphuric acid produces

A. Two moles of sulphuric acid

B. Two moles of peroxymonosulphuric acid

C. One mole of sulphuric acid, one mole of peroxymonosulphuric acid.

D. One mole of sulphuric acid, one mole of peroxymono-sulphuric acid and one mole of hydrogen peroxide.

Answer: C

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72. All the elements of oxygen family are

A. Non-metals

B. Metalloids

C. Radioactive

D. Polymorhic

Answer: D

Watch Video Solution

73. When an inorganic compound reacts with SO_2 in aqueous medium produces $(A).(A)$ on reaction with Na_2CO_3 gives the compound (B) which with sulphur gives a substance (c) used in photography. The compound (c) is.

A. $Na_2S_2O_3$

B. Na_2SO_4

C. Na_2S

D. $Na_2S_2O_7$

Answer: A

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74. Ozone is used for purifying water because

A. It dissociates and release oxygen

B. It does not leave any foul smell like chlorine

C. It kills bacteria, cyst, fungi and acts as a biocide

D. All of the above

Answer: D

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75. Identify the correct sequence of increasing number of $\pi - bonds$ in strcutures of the following molecules.

(I) $H_2S_2O_6$

(II) H_2SO_3

(III) $H_2S_2O_5$.

A. $(I), (II), (III)$

B. $(II), (III), (I)$

C. $(II), (I), (III)$

D. $(I), (III), (II)$

Answer: B

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76. Sulphur reacts with chlorine in $1:2$ ratio and forms X hydrolysis of X gives a sulphure compound Y. What is the hybridisation state od central atom in the compound?

A. sp

B. sp^3

C. sp^2

D. sp^2d

Answer: B

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77. Which gas is used to improve the atmosphere of the crowded places ?

A. H_2

B. O_2

C. O_3

D. N_2O

Answer: C

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Exercises Integer

1. The number of unpaired electrons in the valence shell of the members of oxygen family is ____.

Watch Video Solution

2. What is oxidation state of sulphur is Caro's acid ?

Watch Video Solution

3. How many orbitals are involved in the hybridisation of sulphur in SCl_2?

Watch Video Solution

4. How many $\pi - bonds$ are present in Marshall's acid ?

Watch Video Solution

5. Ozone reacts with dry iodine to form an oxide having ____oxygen atoms in its molecules.

Watch Video Solution

6. How many lone pairs are present in OF_2 molecule ?

Watch Video Solution

7. What is the atomicity of S in sulphur in sulphate ion ?

Watch Video Solution

8. What is the oxidation state of sulphur in sulphate ion ?

Watch Video Solution

9. How many $S-S$ bonds are present in S_8 molecule ?

Watch Video Solution

10. Among the oxides gives below, how many are acidic ?

$CrO_3, Mn_2O_7, CO, SO_2.$

Watch Video Solution

11. In how many of the following species, S-atom is sp^3 hybridised ?

$S_8, SO_4^{2-}, SO_3, H_2S, SCl_4.$

Watch Video Solution

12. What is the number of σ bonds present in peroxodisulphuric acid ?

Watch Video Solution

13. What is the bond order of O_2 molecule ?

Watch Video Solution

14. Conc. H_2SO_4 reacts with four moles of Ag to give ____ moles of Ag_2SO_4.

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Exercises Fill In The Blanks

1. In the preparation of O_2 from $KClO_3$, MnO_3 act as a____.

Watch Video Solution

2. Ozone is an ____of oxygen.

Watch Video Solution

3. (a)iodine dissolves more in KI solution than in water. Why?

(b) Colour of KI solution containing starch turns deep blue when chlorine water is added. Explain.

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4. When SO_2 gas is passed through an acidified solution of $K_2Cr_2O_7$, the solution turns ___ in colour.

Watch Video Solution

5. The percentage of ozone is ozonised oxygen is about ____.

Watch Video Solution

6. Poison for platinum, a catalyst in contact process of H_2SO_4 is ___.

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7. Elements O, S, Se and Te are usually known as____.

Watch Video Solution

8. Sulphur in SF_6 undergoes ____ hybridisations.

Watch Video Solution

9. The most abundant element in earth's crust is

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10. Oxygen was discovered by___.

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11. Bleaching action of SO_2 is due to_____.

Watch Video Solution

12. H_2SO_4 is added while preparing a standard solution of Mohr's salt to prevent ___.

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13. Chalocogen used in vulcanisation of rubber is ____.

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14. _____is known as king of chemicals.

Watch Video Solution

15. Low volatile nature of sulphuric acid is due to ____.

Watch Video Solution

16. The gas absorbed by oil of turpentine is___.

Watch Video Solution

17. The only element in group 16 elements, which is definitely a metal is___.

Watch Video Solution

18. Sulphuric acid is a___acid .

Watch Video Solution

19. Moist iodine reacts with ozone to form.

Watch Video Solution

20. Compound of sulphur used inn electrical transformer is ____.

Watch Video Solution

21. Mixture of O_2 and N_2O is used as ____.

Watch Video Solution

22. Oxygen exhibit positive oxidation state with____.

Watch Video Solution

Watch Video Solution

23. Six volumes of oxygen, on complete ozonisation form ____ volumes of ozone.

Watch Video Solution

24. Liquid oxygen is___ in colour.

Watch Video Solution

25. Addition of water to concentrated sulphuric acid is an ___reaction.

Watch Video Solution

26. Vegetable colourung matter in presence of moisture is bleached by SO_2 due to ___.

Watch Video Solution

27. Solution of SO_2 in water in known as _____.

Watch Video Solution

28. Allotrope of sulphur which is stable below $90^\circ C$ is ____.

Watch Video Solution

29. Rhombic and monoclinic sulphur are _____.

Watch Video Solution

30. Number of σ and π bonds present in sulphuric acid molecule is ___ and ___ respectively.

Watch Video Solution

Exercises True False

1. Most stable allotropic form of sulphur is rhombic sulphur.

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2. The percentage of ozone is ozonised oxygen is about 80%.

Watch Video Solution

3. Anhydride of sulphuric acid is

Watch Video Solution

4. Oxyegn molecule is diamagnetic.

Watch Video Solution

5. Hg loses its meniscus after reacting with ozone.

Watch Video Solution

6. Ozone is obtained by silent electric disacharge on oxygen.

Watch Video Solution

7. In sulphite ion, the oxidation state of sulphur is $+4$ and S is sp^3 hybridised.

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8. Acid used in lead storage battery is sulphuric acid.

Watch Video Solution

9. The reaction of $HCOOH$ with $conc.\ H_2SO_4$ gives :

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10. Generally H_2O exists as a liquid due to intermolecular hydrogen bonding.

Watch Video Solution

11. Ozone belongs to group 16 of the periodic table.

Watch Video Solution

12. All the elements of the oxygen family are radioactive.

Watch Video Solution

13. Oxygen exists as a gas, while sulphur exists as a solid Why ?

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14. Sulphur is the second most electronegative element in the periodic table.

Watch Video Solution

15. Different allotropuc forms of sulphur differ in crystalline structure.

View Text Solution

Archives Multiple Correct

1. The pair(s) of reagents that yield paramagnetic species is/are

A. Na and excess of NH_3

B. K and excess of O_2

C. Cu and dilute HNO_3

D. O_2 and 2-ethylanthraquinol

Answer: A::B::C

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Archives Single Correct

1. The oxide that gives H_2O_2 on treatment with a dilute acid is

A. PbO_2

B. Na_2O_2

C. MnO_2

D. TiO_2

Answer: B

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2. There is no $S - S$ bond in

A. $S_2O_4^{2-}$

B. $S_2O_5^{2-}$

C. $S_2O_3^{2-}$

D. $S_2O_7^{2-}$

Answer: D

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3. The oxidation states of the most electronegative element in the products of the reaction between BaO_2 with dilute H_2SO_4 are

A. 0 and -1

B. -1 and -2

C. -2 and 0

D. -2 and -1

Answer: D

Watch Video Solution

4. The species that does not contain peroxide bond is //are :

A. PbO_2

B. H_2O_2

C. SrO_2

D. BaO_2

Answer: A

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5. Hydrolysis of one mole of peroxodisulphuric acid produces

A. $2mol$. Of sulphuric acid.

B. $2mol$. Of peroxomono sulphuric acid.

C. $Imol$. Of sulphuric acid and $1mol$. Of peroxomono sulphuric acid.

D. $1mol$. Of sulphuric acid, $1mol$. Of peroxomono sulphuric acid, and $1mol$. Of hydrogen peroxide.

Answer: C

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6. Which one of the following oxides is neutral?

A. CO

B. SnO_2

C. ZnO

D. SiO_2

Answer: A

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7. Amongst H_2O, H_2S, H_2Se and H_2Te, the one with the highest boiling point is :

A. H_2O because of hydrogen bonding.

B. H_2Te because of higher molecular weight.

C. H_2S because of hydorgen bonding.

D. H_2Se because of lower molecular weight.

Answer: A

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8. The number is S - S bonds in sulphar trioxide times S_3O_9 is

A. three

B. two

C. one

D. zero

Answer: D

Watch Video Solution

9. Which of the following will not be oxidized by O_3 ?

A. KI

B. $FeSO_4$

C. $KMnO_4$

D. K_2MnO_4

Answer: C

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10. The species having pyramidal shape is

A. SO_3

B. BrF_3

C. SiO_3^{2-}

D. OSF_2

Answer: D

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11. Which of the following does not give oxygen on heating ?

A. $K_2Cr_2O_7$

B. $(NH_4)_2Cr_2O_7$

C. $KClO_3$

D. $Zn(ClO_3)_2$

Answer: B

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Archives Integer

1. Among the following , the number of elements showing only one non-zero oxidation state is:

$O, C, F, N, P, Sn, Tl, Na, Ti$

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2. The value of n in the molecular fromula $Be_nAl_2Si_6O_{18}$.

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3. The difference in the oxidation numbers of two types of sulphul atoms in $Na_2S_4O_6$ is.....

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4. A list of species having the formula XZ_4 is given below $XeF_4, SF_4, SiF_4, BF_4^{\Theta}, [Cu(NH_3)_4]^{2+}, [FeCl_4]^2, [CoCl_4]^{2-}$ and $[PtCl_4]^{2-}$

Defining shape on the basis of the location of X and Z atoms , the total number of species having a square planar shape is

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Archives Fill In The Blanks

1. The lead chamber process involves oxidation of SO_2 by atomic oxygen under the influence of ___as catalyst.

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Archives Subjective

1. Water is a liquid, while H_2S is a gas at ordinary temperature. Explain.

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2. (a) Sulphur melts form a clear mobile liquid at $119^\circ C$ but on further heating to $180^\circ C$, it becomes viscous. Why ?

(b) $SOCl_2$ can act as a weak Lewis acid as well as a weak Lewis base. Explain.

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3. What happens when hydrogen sulphide is bubbled through an aqueous solution of sulphur dioxide.

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4. Complete and balance the following reactions :

$S + OH^{\Theta} \rightarrow S_2O_3^{2-} + \ldots..$

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5. "The valency of oxygen is generally two, whereas sulphur shows valency of two, four, and six". Explain.

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6. Arrange the following as indicated.

CO_2, N_2O_5, SiO_2 and SO_3 in the order of increasing acidic character.

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7. Write two resonance structures of ozone which satisfy the octet rule.

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8. Sulphur is precipitated in the reaction of hydrogen sulphide with sodium bisulphite solution.

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9. Explain why, sulphur dioxide is a more powerful reducing agent in the alkaline medium than in the acidic medium.

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10. In the contact process for industrial manufacture of sulphuric acid, some amount of sulphuric acid is used a starting material. Explain briefly. What is the catalyst used in the oxidation of SO_2 ?

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