CHEMISTRY

BOOKS - MTG WBJEE CHEMISTRY (HINGLISH)

CHEMISTRY OF NON-METALLIC ELEMENTS AND THEIR COMPOUNDS

Wb Workout Category 1 Single Option Correct Type

1. Thermodynamically, the most stable allotrope of C is

A. diamond

B. graphite

C. anthractice

D. all of these

Answer: B

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2. Dry ice is

A. solid NH_3

B. solid SO_2

C. solid CO_2

D. dry CO_2 gas

Answer: C

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3. The carbon atoms in graphics are

A. sp^3-hybridized

B. sp-hybridized

C. sp^2-hybridized

D. none of these

Answer: C

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4. Diamond and graphite are shown to be allotropic forms of carbon by the fact that

A. diamond is hard but graphite is soft

B. diamond is transparent while graphics is opaque

C. they have different crystal structures

D. both from CO_2 when burnt.

Answer: D

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5. Which of the following statement is not true for carbon?

A. It forms compounds with multiple bonds.

B. Its ionization energy is very high.

C. It undergoes catenation.

D. It shows inert pair effect.

Answer: D

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6. The element which occurs in the gaseous state at room temperature is

A. phosphours

B. nitrogen

C. arsenic

D. antimony.

Answer: B

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7. Which of the following molecules show $p\pi - p\pi$ bonding?

A. p_4

B. As_4

C. Sb_4

D. N_2

Answer: D

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8. NCI_5 is not formed because

A. it is unstable

B. nitrogen is inert

C. nitrogen does have d-orbitals

D. nitrogen has small atomic radius.

Answer: C

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9. Hypophosphorous acid is

A. a triprotic acid

B. a diprotic acid

C. a monoprotic acid

D. not acidic at all.

Answer: C

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10. Of the following, the most acidic is

A. As_2O_3

B. P_2O_3

C. Sb_2O_3

D. Bi_2O_3

Answer: B

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11. White phosphorus is kept under

A. cold water

B. ammonia

C. alcohol

D. Kerosene.

Answer: A

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12. Of the different allotropic forms of phosphorus, the one which has a metallic lustre is

A. black phosphorus

B. red phosphorus

C. white phosphorus

D. scarlet phosphorus.

Answer: A

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13. An allotrope of phosphorus used in safety matches is

A. white phosphours

B. red phosphorus

C. violet phosphorus

D. black phosphorus.

Answer: B

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14. which of the following salts used I the bead test for basic radicals?

A. $Na(NH_4)HPO_4.4H_2$

B. Na_2HPO_4

C. $(NH_4)_2SO_4.FeSO_4.6H_2O$

D. $(NH_4)_2HPO_4.2H_2O$

Answer: A

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15. White phosphorus reacts with caustic soda. The products are PH_3 and NaH_2PO_2. This reaction is an example of

A. oxidation

B. reduction

C. oxidation and reduction

D. neutralisation.

Answer: C

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16. Phosphine is not obtained by the reaction when

A. white P is heated with NaOH

B. red P is heated with NaOH

C. Ca_3P_2 reacts with water

D. P_4O_6 is boiled with water.

Answer: B

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17. Oxygen exhibits positive oxidation state in

A. CO

B. F_2O

C. NO

D. N_2O

Answer: B

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

A. oxygen is more electronegative than sulphur

B. sulphur contains d-orbitals whereas oxygen does not

C. sulphur has larger atomic radius than oxygen

D. sulphur is more electronegative than oxygen.

Answer: B

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19. Which of the following is the most electronegative element?

A. O

B. S

C. Se

D. Te

Answer: A

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20. Which reaction is not feasible?

A. $2KI + Br_2 \rightarrow 2KBr + I_2$

B. $2KBr + I_2 \rightarrow 2KI + Br_2$

C. $2KBr + Cl_2 \rightarrow 2KCl + Br_2$

D. $2H_2O + 2F_2 \rightarrow 4HF + O_2$

Answer: B

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21. Consider the following reaction

$$6NaOH + 3Cl_2 \xrightarrow{\text{Hot conc.}} 5NaCl + A + 2H_2O$$

What is the oxidation number of chlorine in "A"?

A. $+5$

B. -1

C. $+3$

D. $+1$

Answer: A

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22. Which of the following statement is not correct?

A. Silicon is extensively used as a semiconductor.

B. Carborundum is SiC.

C. Silicon occurs in free state in nature.

D. Mica contains the element silicon.

Answer: C

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23. Which of the following statements regarding ozone is not correct ?

A. The ozone molecule is angular in shape.

B. The ozone is resonance hybrid of two structures.

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

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

Answer: C

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24. Which of the following is used to prepare CI_2 gas at room temperature from concentrated HCI?

A. MnO_2

B. H_2S

C. $KMnO_4$

D. Cr_2O_3

Answer: C

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25. Which one of the following statements is not true at room temperature and pressure?

A. p_4O_{10} is a white solid.

B. SO_2 is a colourless gas.

C. SO_3 is a colourless gas.

D. NO_2 is a brown gas.

Answer: C

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26. The stable bivalency of Pb and trivalency of Bi is

A. due to d contraction in Pb and Bi

B. due to relativistic contraction of the 6s orbitala of Pb and Bi, leading to inter pair effect

C. due to screening effect

D. due to attainment of noble configuration.

Answer: B

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27. The number of acidic protons in H_3PO_3 are

A. 0

B. 1

C. 2

D. 3

Answer: C

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28. HF is not kept inside

A. glass bottle

B. plastic bottle

C. tin bottle

D. iron bottle

Answer: A

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29. $NaHSO_4 + NaCI \xrightarrow{823K} A + B$

Identify A and B.

A. Na and HCI

B. Na_2SO_4 and HCI

C. NaH and Na_2SO_4

D. None of these

Answer: B

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30. When KI is added to acidified solution of sodium nitrite

A. NO gas is liberated and I_2 is set free

B. N_2 gas is liberated and HI is produced

C. N_2O gas liberated and I_2 is set free

D. N_2 gas is liberated and HOI is produced.

Answer: A

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Wb Workout Category 2 Single Option Correct Type

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

(i) It acts both as a proton donor as well as a proton acceptor.

(ii)It reacts readily with basic and acidic oxides.

(iii)It oxidises Fe at its boiling point.

(iv) It is a poor conductor of electricity.

The oxide is

A. H_2O

B. SO_2

C. NO_2

D. CO_2

Answer: A

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2. Which of the following statements is correct?

A. Silicon exhibits 4 coordination number in its compounds.

B. Bond energy of F_2 is less than CI_2

C. Mn(III) oxidation state is more stable than Mn(II) in aqueous state

D. Elements of 15th group show only $+3$ and $+5$ oxidation states.

Answer: B

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3. Concentrated hydrochloric acid when kept in open air sometimes produces a cloud of white fumes. The explanation for it is that

A. oxygen in air reacts with the emitted HCI gas to form a cloud of chlorine gas

B. strong affinity of IICI gas for moisture in air results in forming of droplets of liqiud solutin which appears like a clouds smoke

C. due to strong affinity for atmopheric oxide of sulphur

D. conc. HCI emits strongly smelling HCI gas all the time

Answer: B

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4. Five most abundant elements in the living cell are

A. C, H, O, N, Fe

B. C, H, O, N, P

C. C, H, N, Mg, Ca

D. C, H, Fe, Mg, Ca

Answer: B

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5. Reaction of HNO_3 with I, S, P and C gives respectively

A. HIO_3, H_2SO_4, H_3PO_4 and CO_2

B. HIO_3, H_2SO_4, H_3PO_3 and CO_2

C. I_2O_5, H_2SO_4, H_3PO_4 and CO

D. I_2O_5, SO_2, P_2O_5 and CO_2

Answer: A

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6. Which gas evolve when ammonia solution is added to potassium parmanganate?

A. N_2

B. NO

C. NO_2

D. N_2O_5

Answer: A

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7. Which one of the following statements about the zeolites is false?

A. They are used as cation exchangers.

B. They have open structure which enables them to take up small molecules.

C. Zeolites are aluminosilicates having three dimensional network.

D. Some of the SiO_4^{4-}. units are replaced by AlO_4^{5-} and AlO_(6)^(9-)` ions in zeoplites.

Answer: D

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8. Amorphous boron is extracted from borax by following steps.

$$\text{Borax} \xrightarrow{(A)} H_3BO_3 \xrightarrow{(B)} B_2O_3 \xrightarrow{(C)} \text{Boron}$$

(A) and (C) are

A. H_2SO_4, Al

B. HCl, C

C. H_2SO_4, Mg

D. HCl, Fe

Answer: C

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9. When a burning Mg-ribbon is introduced into a jar of colourless gas $'A'$, the product $'B'$ is the obtained . $'B'$ on boiling with water gives a gas $'C'$ with pungent odour. When $'C'$ gas is paused over heated cupric oxide, again the gas $'A'$ is obtained. Identify C.

A. N_2

B. Mg_3N_2

C. H_2O

D. NH_3

Answer: D

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10. What happens when concentrated H_2SO_4 is slowly added to a mixture of solution of $NaNO_3$ and $FeSO_4$?

A. Green ring of $Fe(SO_4)_3$ is formed.

B. Browing ring of $\left[Fe(H_2O)_5NO\right]SO_4$ is formed

C. Brown ring of $Fe_2(SO_4)_3$ is formed.

D. None of these

Answer: B

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11. When NH_3 is treated with diborane at low temperature and then heated at $200^\circ C$, the product formed is

A. B_2H_6

B. $B_2N_2H_6$

C. $B_3N_3H_6$

D. $B_2H_6N_2$

Answer: C

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12. A sodium salt (A) when reacts with dilute HCI produces a salt and a colouless, rotten egg smelling gas (B). (B) when passed through lead

acetate solution produces a black precipitate (C). Futher (C) on treatment with H_2O_2 solution yields a white precipitate (D). Identify (A).

A. H_2S

B. Na_2S

C. Na_2SO_4

D. $PbSO_4$

Answer: B

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13. Concentrated H_2SO_4 on being heated with zinc yields a gas (A), which when passed through bromine solution produces a white precipitate (D) with $BaCI_2$ solution while the acid (C), when heated with concentrated H_2SO_4 yields the original gas (A) and another reddish brown gas (E). Identify B.

A. H_2S

B. H_2SO_4

C. SO_2

D. HBr

Answer: B

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14. A colourless soid (X) on heating ives another soid (Y) with evolution of oxygen gas. The solid (Y) on treatment with hydrochloric acid produces a brown gas. Again solid (Y) is mixed with NH_4CI and the mixture on heating produes a colourless gas (Z). Identify Z.

A. H_2

B. O_2

C. N_2

D. CO_2

Answer: C

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15. An orange coloured solid (A) on heating left a green residue (B) with evolution of a colourless gas (C) and water vapour. When the gas (C) is passed over heated Mg a white solid (D) is formed. The soid (D) on boiling with water produces a gas (E), that forms a dense white

fumes when comes in contact with HCI. Identify (A) to (E) from the options given below.

A.

A	B	C	D	E
Cr_2O_3	CrO_3	Mg_3N_2	N_2	NH_3

B.

A	B	C	D	E
Cr_2O_3	$(NH_4)_2Cr_2O_7$	N_2	Mg_3N_2	NH_3

C.

A	B	C	D	E
$(NH_4)_2Cr_2O_7$	Cr_2O_3	N_2	Mg_3N_2	NH_3

D.

A	B	C	D	E
$(NH_4)_2Cr_2O_7$	Cr_2O_3	N_2	CrO_2Cl_2	NH_3

Answer: C

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Wb Workout Category 3 One Or More Option Correct Type

1. Out of CO_2, SiO_2, GeO_2, SnO_2 and PbO_2

A. solid carbon dioxide and silicon dioxide are hard solid

B. CO_2 and SiO_2 are acidic and SnO_2 is amphoteric

C. PbO_2 reacts with H_2SO_4 to give $PbSO_4$

D. CO_2 does not contain $p\pi - p\pi$ bonding.

Answer: B::C

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2. CO_2 is isostructural with

A. $SnCI_2$

B. $HgCI_2$

C. SCI_2

D. ZnI_2

Answer: B::D

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3. Decomposition of oxalic acid I presence of conc. H_2SO_4 gives

A. CO

B. CO_2

C. formic acid

D. H_2O

Answer: A::B::D

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4. Boron + $O_2 \xrightarrow{700^\circ C} (X)$

$(X) + C(\text{carbon}) + Cl_2 + (Y) + CO$

$(Y) + LiAlH_4 \rightarrow (Z) + LiCl + AlCl_3$

Compound (Z) is

A. an ionic compound

B. an electron deficient compound

C. $3c - 2e$ compound

D. having ethane like structure.

Answer: B::C

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5. Which of the following reaction can evolve phosphine?

A. White $P + Ca(OH)_2 \rightarrow$

B. $AlP + H_2SO_4 \rightarrow$

C. $H_3PO_3 \xrightarrow{\text{Heat}}$

D. $PH_4I + NaOH \rightarrow$

Answer: B::C::D

View Text Solution

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

A. H_2SO_4

B. H_2SO_3

C. H_2SO_5

D. $H_2S_2O_8$

Answer: C::D

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7. Select the correct statements about oxygen molecule.

A. It is paramagnetic.

B. Its bond order is two

C. In liquid state it is blue coloured.

D. It has two unpaired electrons.

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

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8. Which of the following statements is/are correct.

A. SO_2 dissolves in water to form sulphur acid.

B. SO_2 acts as a bleaching agent.

C. SO_2 has pungent odour.

D. SO_2 acts only as oxidising agent.

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

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9. $HNO(3)$ can be in Al vessel bu $NaOH$ cant't be, because

A. Al developes a protective layer of oxide with HNO_3

B. Al reacts with HNO_3 to dissolve it

C. Al reacts with $NaOH$ forming $NaAlO_2$

D. Al develops a protective layer of oxide with $NaOH$.

Answer: A::C

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10. Choose the corret statements (s)

A. Oxides of carbon family (MO_2) are all network solids wit octahedral coordination.

B. Silica is a network solid with tetrahedral coordination

C. Carbon dioxide, tin dioxide and lead dioxide are all acidic oxides.

D. $N(CH_3)_3$ has pyramidal structure.

Answer: B::D

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11. Stability of monovalent and trivalent cations of Ga, In, TI lie in the following sequence

A. $Ga^{3+} < \ln^{3+} > Tl^{3+}$

B. $Ga^{3+} > \ln^{3+} > Tl^{3+}$

C. $Tl^{+} > \ln^{+} > Ga^{+}$

D. $Ga^{3+} > \ln^{+} > Tl^{+}$

Answer: B::C

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12. Which of the following arrangements truly represent the property indiceted against it?

A. $Br_2 < Cl_2 < F_2$ (bond energy)

B. $Br_2 < Cl_2 < F_2$ (electronegativity)

C. $Br_2 < Cl_2 < F_2$ (oxidising power)

D. $Br_2 < Cl_2 < F_2$ (electron affinity)

Answer: B::C

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13. Which of the following is/are not correct regarding graphite?

A. Graphite is anisotropic.

B. Graphite is isotropic.

C. Graphite is oxidised by not concentrated HNO_3 to metalic acid

D. Graphite is unaffected by HF .

Answer: B::D

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14. Which of the following statements is/are correct?

A. Fluorine does not show positive oxidation state.

B. Fluorine is most reactive.

C. HF is the strongest acid.

D. X-X bond dissociation energy is minimum in Br_2

Answer: A::B

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15. Which of the following is/are correct

A. Bond angle : $PH_3 < PCl_3 < PBr_3 < PI_3$

B. Acidic strength :

$$HClO < HClO_2 < HClO_3 < HClO_4$$

C. Reducing nature :

$$H_2O > H_2S > H_2Se > H_2Te$$

D. Lewis acid character :

$$BF_3 < BCl_3 < BBr_3 < BI_3$$

Answer: A::B::D

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Wb Jee Previous Years Questions Category 1 Single Option Correct Type

1. In diborane, the number of electrons that account for bonding in the bridges is

A. six

B. two

C. eight

D. four

Answer: D

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2. In $SOCI_2$, the CI-S-CI and CI-S-O bond angles are

A. 130° and 115°

B. 106° and 96°

C. 107° and 108°

D. 96° and 106°

Answer: D

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3. Chlorine gas reacts with red hot calcium oxide to give

A. bleaching powder and dichlorine monoxide

B. bleaching powder and water

C. calcium chloride and chlorine dioxide

D. calcium chloride and oxygen.

Answer: D

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4. In O_2 and H_2O_2 the O - O bond lenghts are 1.21 and 1.48 Å . Respectively. In ozone, the average O - O bond length is

A. 128Å

B. 1.18Å

C. 1.44Å

D. 1.52Å

Answer: A

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5. Addition of excess potassium iodide solution to a solution of mercuric chloride gives the halide complex

A. tetrachedral $K_2[HgI_4]$

B. trigonal $K[HgI_3]$

C. linear Hg_2I_2

D. square planer $K_2[HgCI_2I_2]$

Answer: A

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6. The orange solid on heating gives a colourless gas and a green solid which can be reduced to metal by aluminium powder. The orange and the green solids are, respectively.

A. $(NH_4)_2Cr_2O_7$ and Cr_2O_3

B. $Na_2Cr_2O_7$ and Cr_2O_3

C. $K_2Cr_2O_7$ and CrO_3

D. $(NH_4)_2CrO_4$ and CrO_3

Answer: A

View Text Solution

7. Sulphan' is

A. a mixture of SO_3 and H_2SO_5

B. $100\ \%$ conc. H_2SO_5

C. a mixture of gypsum and conc. H_2SO_4

D. 100% oleum (a mixture of 100% SO_3 in 100% H_2SO_4

Answer: D

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8. The inreasing order of O-N-O bond angel in the species NO_2, NO_2^+ and NO_2^- is

A. $NO_2^+ < NO_2 < NO_2^-$

B. $NO_2 < NO_2^- < NO_2^+$

C. $NO_2^+ < NO_2^- < NO_2$

D. $NO_2 < NO_2^+ < NO_2^-$

Answer:

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9. If CI_2 is passed through hot aqueous NaOH, the products formed have CI in different oxidation states. These are indicated as

A. -1 and $+1$

B. -1 and $+5$

C. $+1$ and $+5$

D. -1 and $+3$

Answer: B

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10. Sulphphuryl chloride (SO_2CI_2) reacts with white phosphorus (P_4) to give

A. PCI_5, SO_2

B. $OPCI_3, SOCI_2$

C. PCI_5, SO_2, S_2CI_2

D. $OPCI_3, SO_2, S_2CI_2$

Answer: A

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11. Nitrogen dioxide is not produced on heating

A. KNO_3

B. $Pb(NO_3)_2$

C. $Cu(NO_3)_2$

D. $AgNO_3$

Answer: A

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12. The boiling points of HF, HCI, HBr and HI follow the order

A. $HF > HCI > HBr > HI$

B. $HF > HI > HBr > HCl$

C. $HI > HBr > HCl > HF$

D. $HCl > HF > HBr > HI$

Answer: B

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13. In the solid state PCl_5 exists as

A. $[PCl_4]^-$ and $[PCl_6]^+$ ions

B. covalent PCl_5 molecules only

C. $[PCl_4]^+$ and $[PCl_6]^-$ ions

D. covalent P_2Cl_{10} molecules only

Answer: C

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14. The acid in which O - O bonding is present, is

A. $H_2S_2O_3$

B. $H_2S_2O_6$

C. $H_2S_2O_8$

D. $H_2S_4O_6$

Answer: C

View Text Solution

15. $PbCl_2$ is insoluble in cold water. Addition of HCl increases its solubility due to

A. formation of soluble complex anions like $[PbCl_3]^-$

B. oxidation of $Pb(II)$ to $Pb(IV)$

C. formation of $\left[Pb(H_2O)_6\right]^{2+}$

D. formation of polymeric lead complexes.

Answer: A

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16. Cl_2O_7 is the anhydride of

A. $HOCl$

B. $HClO_2$

C. $HClO_3$

D. $HClO_4$

Answer: D

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17. The main reason that $SiCl_4$ is easily hydrolysed as compared to $CCl_4$is that

A. $Si - Cl$ bond is weaker than C - Cl bond

B. $SiCl_4$ can form hydrogen bonds

C. $SiCl_4$ can form hydrogen bonds

D. Si can extend its coordination number beyond four.

Answer: D

View Text Solution

18. Which of the following is present in maximum amount in acid rain?

A. HNO_3

B. H_2SO_4

C. HCl

D. H_2CO_3

Answer: B

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19. Which of the set of oxides are arranged in the proper order of basic, amphoteric, acidic?

A. SO_2, P_2O_5, CO

B. BaO, Al_2O_3, SO_2

C. CaO, SiO_2, Al_2O_3

D. CO_2, Al_2O_3, CO

Answer: B

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20. The first electron affinity of C, N and O will be of the order

A. $C < N < O$

B. $N < C < O$

C. $C < O < N$

D. $O < N < C$

Answer: B

View Text Solution

21. The creative species in chlorine bleach is

A. CI_2O

B. OCI^{-1}

C. CIO_2

D. HCl

Answer: B

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Wb Jee Previous Years Questions Category 2 Single Option Correct Type

1. In borax, the number of B - O - B links and B - OH bonds present are, respectively

A. five and four

B. four and five

C. three and four

D. five and five.

Answer: A

View Text Solution

2. On heating, chloride acid decomposes to

A. $HCIO_4$, CI_2, O_2 and H_2O

B. $HCIO_2$, CI_2, O_2 and H_2O

C. $HCIO$, CI_2O and H_2O_2

D. HCI, $HCIO$, CI_2O and H_2O

Answer: A

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3. The bond angle in $NF_3(102.3^\circ)$ is similar than $NH_3(107.2^\circ)$. This is because of

A. large size of F compared to H

B. large size of N compared of F

C. opposite polarity of N in the two molecules

D. small size of H compared to N.

Answer: C

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Wb Jee Previous Years Questions Category 3 One Or More Option Correct Type

1. white phosphorus P_4 has the following characteristics.

A. 6P - P single bonds

B. 4P - P single bonds

C. 4 lone pair of electrons

D. P - P - P angle of 60°

Answer: A::C::D

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