p-Block Elements

Question1

Identify the correct order of acidity of hydrides of 16^{th} group elements from the following.

MHT CET 2025 5th May Evening Shift

Options:

A.

$H_2O > H_2S > H_2Se > H_2Te$

B.

$H_2Te > H_2O > H_2S > H_2Se$

C.

$H_2Te > H_2Se > H_2S > H_2O$

D.

$H_2Te > H_2Se > H_2O > H_2S$

Answer: C

Solution:

The acidic character of the hydrides increases from H_2O to H_2Te because the bond dissociation enthalpy of the H-E bond decreases down the group. (where, $E = O, S, Se, Te$)

Question2

Which of the following halogens does always show oxidation state -1 ?

MHT CET 2025 5th May Evening Shift

Options:

A.

Cl

B.

F

C.

Br

D.

I

Answer: B

Solution:

Concept:

- Halogens generally show an oxidation state of **–1** (due to their high electronegativity).
- However, except for fluorine, other halogens (Cl, Br, I) can also exhibit positive oxidation states like +1, +3, +5, +7 due to the presence of vacant d orbitals.
- **Fluorine (F)** is the most electronegative element. It does not show positive oxidation states—thus it **always exhibits –1 oxidation state** in compounds.

Correct Answer:

Option B: F (Fluorine) ✅

Question3

What is oxidation state of xenon in xenonmonooxytetrafluoride?

MHT CET 2025 26th April Evening Shift

Options:

A.

+2

B.

+4

C.

+6

D.

+8

Answer: C

Solution:

Let the oxidation state of xenon (Xe) be x in xenonmonoxytetrafluoride $(XeOF_4)$

$x + 1(-2) + 4(-1) = 0$
$x - 2 - 4 = 0$
$x = +6$

Question4

What is the number of oxygen atoms bonded to chlorine in its strongest oxoacid?

MHT CET 2025 26th April Morning Shift

Options:

A. 1

B. 2

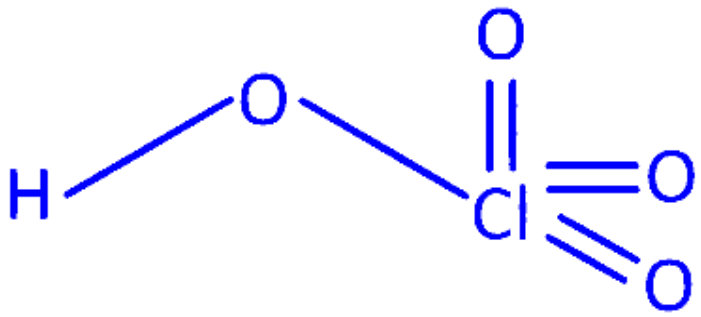
C. 3

D. 4

Answer: D

Solution:

Perchloric acid ($HClO_4$), the strongest oxoacid of chlorine, has four oxygen atoms bonded to chlorine



Question5

Which among the following salt turns blue litmus red in its aqueous solution?

MHT CET 2025 26th April Morning Shift

Options:

A. $CuSO_4$

B. Na_2CO_3

C. Na_2SO_4

D. $NaNO_3$

Answer: A

Solution:

$CuSO_4$ is a salt of strong acid (H_2SO_4) and weak base $(Cu(OH)_2)$.

$\therefore$ The aqueous solution of $CuSO_4$ is acidic in nature and turns blue litmus red.

Question6

Which of the following statements is false about oxygen and sulphur?

MHT CET 2025 26th April Morning Shift

Options:

A.

Atoms of oxygen and sulphur consist two unpaired electrons in valence shell.

B.

Oxygen and sulphur show $-2, +4$ and +6 oxidation states.

C.

Oxygen is gas while sulphur is solid at room temperature.

D.

Hydride of oxygen is more stable than hydride of sulphur.

Answer: B

Solution:

Oxygen shows $-2, -1, -1/2$ and +2 oxidation states while sulphur shows $-2, +2, +4, +6$ oxidation states.
Oxygen cannot exhibit higher oxidation state due to absence of vacant d orbitals.

Question7

Which of the following is an acidic oxide?

MHT CET 2025 25th April Evening Shift

Options:

A. CO

B. NO

C. N_2O

D. N_2O_5

Answer: D

Solution:

- **CO (carbon monoxide):** This is a neutral oxide. It does not show acidic or basic nature in water under normal conditions.
- **NO (nitric oxide):** This is also a neutral oxide. It does not directly form acids.
- **N_2O (nitrous oxide):** This is likewise considered a neutral oxide.
- **N_2O_5 (dinitrogen pentoxide):** This is an acidic oxide. It is the anhydride of nitric acid:

$$N_2O_5 + H_2O \rightarrow 2HNO_3$$

✅ **Correct Answer:**

Option D: N_2O_5

Question8

Which of the following is existing oxoacid of fluorine?

MHT CET 2025 25th April Morning Shift

Options:

A. HFO

B. HFO_2

C. HFO_3.

D. HFO_4

Answer: A

Solution:

Step 1: Recall basic facts

- Fluorine is the **most electronegative element**.
- Because of this, it does **not** exhibit positive oxidation states (it cannot center oxoacids the way chlorine, bromine, or iodine do).
- Therefore, *true oxoacids of fluorine do not exist*.

But some compounds are sometimes called "pseudo-oxoacids" of fluorine. The one known is **fluoric (II) acid or hypofluorous acid, HOF**.

Structure:

H–O–F

This is best regarded as an *oxyacid of fluorine* (though strictly the electronegative atom is at the terminal, not central).

Step 2: Match with options

- **Option A: HFO → actually HOF ≡ hypofluorous acid (known compound, exists).**
- **Option B: HFO_2 → would be HOF_2 (hypothetical, not stable).**
- **Option C: HFO_3 → would imply +5 oxidation state for F → impossible.**
- **Option D: HFO_4 → would imply +7 oxidation state for F → impossible.**

✅ Thus the only existing one is **HOF (written here as HFO in the options).**

Final Answer:

Option A: HFO (i.e., HOF) is the only existing oxoacid of fluorine.

Question9

Which of the following statements is NOT correct about ozone?

MHT CET 2025 25th April Morning Shift

Options:

A. It is strong reducing agent

B. It has angular shape

C. It is good bleaching agent

D. It absorbs harmful Ultra Violet radiation from the sun

Answer: A

Solution:

We need to identify the incorrect statement about **ozone (O_3).**

- **Option A: It is strong reducing agent**

  → This is incorrect. Ozone is actually a **powerful oxidizing agent**, not a reducing agent.

- **Option B: It has angular shape**

  → Correct. Ozone is bent (angular) in shape with a bond angle of about 117°.

- **Option C: It is good bleaching agent**

  → Correct. Ozone is used as a bleaching agent due to its strong oxidizing power.

- **Option D: It absorbs harmful Ultra Violet radiation from the sun**

  → Correct. Ozone in the stratosphere absorbs harmful UV-B and UV-C radiation.

✅ **Answer: Option A (It is strong reducing agent)** is NOT correct.

Question10

Which of the following interhalogen compounds is in liquid state at room temperature?

MHT CET 2025 23rd April Evening Shift

Options:

A. ICl

B. ClF_3

C. BrF_5

D. IF_7

Answer: C

Solution:

Step 1: Recall physical states at room temperature

- **ICl (Iodine monochloride):** Reddish-brown solid/liquid depending on temperature (melting point ≈ 27 °C). At room temperature (~25 °C), this is very close to its melting point, so it can exist as a dark red-brown **liquid just above 27 °C**. Often considered liquid near room temp.
- **ClF_3 (Chlorine trifluoride):** Colorless liquid with melting point ≈ –76 °C and boiling point ≈ 12 °C. So at room temperature (≈25 °C), it will be a **gas**, since boiling point is only 12 °C.
- **BrF_5 (Bromine pentafluoride):** Melting point ≈ –61 °C, boiling point ≈ 40 °C. So at room temperature (≈25 °C), it exists as a **liquid**.
- **IF_7 (Iodine heptafluoride):** Melting point ≈ 4 °C, boiling point ≈ 4.77 °C, so it is a **gas** at room temperature.

Step 2: Conclusion

At **room temperature (~25 °C)**, the interhalogen compound that is liquid is:

Option C: BrF_5

✅ **Answer: C) BrF_5**

Question11

Which of the following inert gases is used for magnetic resonance imaging?

MHT CET 2025 23rd April Morning Shift

Options:

A. He

B. Ne

C. Ar

D. Xe

Answer: A

Solution:

The correct answer is **A. He**.

Magnetic Resonance Imaging (MRI) machines rely on powerful superconducting magnets. To maintain superconductivity (zero electrical resistance), these magnets must be kept at extremely low temperatures. **Liquid helium** (He) is the primary cryogen used for this purpose because it has the lowest boiling point of any element (4.2 Kelvin or -269 °C), making it ideal for cooling the superconducting coils.

Question12

Which of the following is the molecular formula of halous acid of chlorine?

MHT CET 2025 22nd April Evening Shift

Options:

A. HClO

B. $HClO_2$

C. $HClO_3$

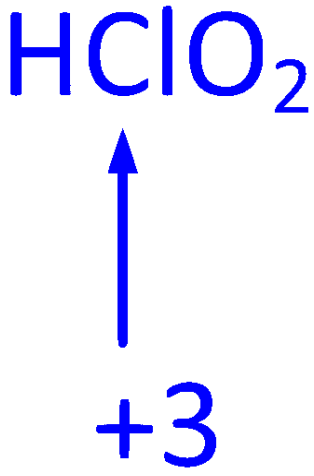
D. $HClO_4$

Answer: B

Solution:

Halous acids are a group of oxyacids where the central halogen atom is ' X ' in +3 oxidation state.

e.g.



Question13

Which of the following halogen forms maximum number of oxoacids?

MHT CET 2025 22nd April Evening Shift

Options:

A. F

B. Cl

C. Br

D. I

Answer: D

Solution:

A. Fluorine (F)

Fluorine is the most electronegative element and its small size prevents it from forming multiple bonds or expanding its octet. It forms only one known oxoacid:

- **HOF** (Hypofluorous acid, F oxidation state: +1)

So, Fluorine forms **1** oxoacid.

B. Chlorine (Cl)

Chlorine forms a series of oxoacids corresponding to its common positive oxidation states:

- **HClO** (Hypochlorous acid, Cl oxidation state: +1)
- **HClO2** (Chlorous acid, Cl oxidation state: +3)
- **HClO3** (Chloric acid, Cl oxidation state: +5)
- **HClO4** (Perchloric acid, Cl oxidation state: +7)

So, Chlorine forms **4** oxoacids.

C. Bromine (Br)

Bromine also forms a series of oxoacids analogous to chlorine, though some are less stable:

- **HBrO** (Hypobromous acid, Br oxidation state: +1)
- **HBrO2** (Bromous acid, Br oxidation state: +3)
- **HBrO3** (Bromic acid, Br oxidation state: +5)
- **HBrO4** (Perbromic acid, Br oxidation state: +7)

So, Bromine forms **4** oxoacids.

D. Iodine (I)

Iodine, being the largest of the halogens listed, can accommodate a higher coordination number compared to chlorine and bromine, especially in its highest oxidation state (+7). This leads to the formation of multiple distinct oxoacids for the same oxidation state.

- **HIO** (Hypoiodous acid, I oxidation state: +1)
- **HIO2** (Iodous acid, I oxidation state: +3)
- **HIO3** (Iodic acid, I oxidation state: +5)

For the +7 oxidation state, iodine forms several distinct compounds:

- **HIO4** (Metaperiodic acid, I oxidation state: +7)
- **H3IO5** (Mesoperiodic acid, I oxidation state: +7)
- **H5IO6** (Paraperiodic acid or Orthoperiodic acid, I oxidation state: +7)

Counting all distinct oxoacids for Iodine: 1 (HIO) + 1 (HIO2) + 1 (HIO3) + 3 (HIO4, H3IO5, H5IO6) = **6** oxoacids.

Comparing the counts:

- Fluorine: 1
- Chlorine: 4
- Bromine: 4
- Iodine: 6

Iodine forms the maximum number of distinct oxoacids.

The final answer is $\boxed{D}$

Question14

What are the different types of bonds formed by sulphur with oxygen in thiosulfuric acid?

MHT CET 2025 22nd April Morning Shift

Options:

A. One double bond and two single bond

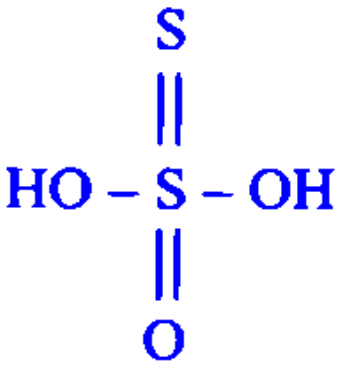
B. One double bond and one single bond

C. Two double bond and one single bond

D. Two double bond and two single bond

Answer: A

Solution:



Thiosulphuric acid ($H_2S_2O_3$)

Question15

Which of the following statements is false about interhalogen compounds?

MHT CET 2025 21st April Morning Shift

Options:

A. They are covalent in nature.

B. They are diamagnetic.

C. They are more reactive than halogens.

D. If these are represented as XX', number of X' atoms is always even.

Answer: D

Solution:

Option D is **false**.

Explanation:

- Interhalogen compounds are formed between two different halogens and are represented as XX', XX'_3, XX'_5, or XX'_7, where X is the less electronegative and larger halogen, and X' is the more electronegative and smaller halogen.

- The number of X' atoms can be 1, 3, 5, or 7, **not always even**. For example:
- ClF $(XX'$; 1 atom of $X')$
- BrF_3 $(XX'_3$; 3 atoms of $X')$
- IF_5 $(XX'_5$; 5 atoms of $X')$

Hence, **Option D** is the correct answer as it is false:

"If these are represented as XX', number of X' atoms is always even."

Question16

Identify false statement from the following about fluorine.

MHT CET 2025 20th April Morning Shift

Options:

A. It is highly electronegative element.

B. It exhibits only -1 oxidation state.

C. It has high bond dissociation enthalpy among all halogens.

D. It form only one oxoacid.

Answer: C

Solution:

Cl has high bond dissociation enthalpy among all halogens.

Question17

Identify the correct molecular formula of 'Oleum' from following.

MHT CET 2025 19th April Evening Shift

Options:

A. $H_2 S_2O_3$

B. $H_2 S_2O_7$

C. $H_2 S_2O_5$

D. $H_2 S_2O_8$

Answer: B

Solution:

Step 1: Recall the definition of Oleum.

- Oleum is fuming sulphuric acid.
- It is formed by dissolving sulphur trioxide (SO_3) in concentrated sulphuric acid (H_2SO_4).

Step 2: Write the reaction.

$H_2SO_4 + SO_3 \longrightarrow H_2S_2O_7$

Step 3: Identify the correct molecular formula.

The product formed is $H_2S_2O_7$, which is called pyrosulphuric acid or Oleum.

Final Answer: Option B $H_2S_2O_7$

Question18

Which of the following statements is correct about O_2 and O_3 molecule?

MHT CET 2025 19th April Evening Shift

Options:

A. O_2 and O_3 are paramagnetic

B. The enthalpy change during the formation of O_3 from O_2 is positive

C. The entropy change in the formation of O_3 from O_2 is positive

D. O_3 is more stable than O_2

Answer: B

Solution:

Step-by-step analysis:

Option A: O_2 and O_3 are paramagnetic

- O_2 (**dioxygen**) is **paramagnetic** because it has two unpaired electrons in its molecular orbital diagram.
- O_3 (**ozone**) is **diamagnetic** because all electrons are paired.
- Thus, this statement is **incorrect**.

Option B: The enthalpy change during the formation of O_3 from O_2 is positive

- Formation: $3\ O_2\ (g) \rightarrow 2\ O_3\ (g)$
- Since ozone (O_3) can easily decompose back to dioxygen (O_2) and is less stable, energy is required to form ozone.
- Therefore, ΔH is **positive** (endothermic reaction).
- This statement is **correct**.

Option C: The entropy change in the formation of O_3 from O_2 is positive

- 3 molecules of O_2 forming 2 molecules of O_3:
- Number of moles of gas decreases.
- Thus, randomness (entropy, S) **decreases**.
- ΔS is **negative** in this process.
- This statement is **incorrect**.

Option D: O_3 is more stable than O_2

- O_3 (*ozone*) is **less stable** than O_2 (*dioxygen*).
- Ozone decomposes easily to give dioxygen.
- This statement is **incorrect**.

Final Answer:

Option B is correct.

The enthalpy change during the formation of O_3 from O_2 is positive

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Question19

Identify the correct order of thermal stability of hydrides of 16 group elements from the following.

MHT CET 2025 19th April Morning Shift

Options:

A. $H_2S < H_2O < H_2Se < H_2Te$

B. $H_2O < H_2S < H_2Se < H_2Te$

C. $H_2Te < H_2Se < H_2S < H_2O$

D. $H_2Se < H_2Te < H_2O < H_2S$

Answer: C

Solution:

We are dealing with **Group 16 hydrides** (H_2O, H_2S, H_2Se, H_2Te).

Let us carefully analyze the **thermal stability trend**.

Step 1: Concept of Thermal Stability

- Thermal stability of hydrides depends on the **bond strength** of the $E–H$ bond (where E = O, S, Se, Te).
- As we go **down the group**, the atomic size increases, resulting in **weaker $E–H$ bond strength**.
- Hence, hydrides become **less stable** down the group.

So, the order of thermal stability is:

$H_2O > H_2S > H_2Se > H_2Te$

Step 2: Compare with given options

- Option A: $H_2S < H_2O < H_2Se < H_2Te$ ❌ (wrong order)
- Option B: $H_2O < H_2S < H_2Se < H_2Te$ ❌ (water should be most stable, not least)
- Option C: $H_2Te < H_2Se < H_2S < H_2O$ ✅ (correct order of decreasing stability)
- Option D: $H_2Se < H_2Te < H_2O < H_2S$ ❌ (wrong)

✅ Final Answer:

Option C

$H_2O > H_2S > H_2Se > H_2Te$

Would you like me to also explain why **boiling point trend** is opposite to the thermal stability trend for these hydrides?

Question20

Which group element from following achieves noble gas configuration after gaining two electrons?

MHT CET 2024 15th May Evening Shift

Options:

A. Group-14

B. Group-15

C. Group-16

D. Group-13

Answer: C

Solution:

The group of elements that achieve a noble gas configuration upon gaining two electrons is **Group-16**. Elements in Group-16, also known as the chalcogens, have six electrons in their valence shell. By gaining two electrons, they complete their outermost shell, achieving the electron configuration of a noble gas. Here's the process described:

Group-16 elements have an electron configuration that ends in ns^2np^4.

To achieve the noble gas configuration, which is ns^2np^6, these elements need to gain two electrons.

After gaining two electrons, their electron configuration becomes complete in the p orbital, making it ns^2np^6, similar to the configuration of a noble gas.

Therefore, the correct option is:

Option C: Group-16

Question21

Which element from following combines with hydrogen to form a compound with lowest thermal stability?

MHT CET 2024 15th May Evening Shift

Options:

A. F

B. I

C. Cl

D. Br

Answer: B

Solution:

The bond dissociation enthalpy of $H - X$ bond decreases in the order: $HF > HCl > HBr > HI$.

Therefore, thermal stability of hydrogen halides also decreases in the order:

$HF > HCl > HBr > HI$

$\therefore$ Iodine combines with H to form a compound with lowest thermal stability.

Question22

What type of hybridisation is involved in central atom of hydrides of group 16 elements?

MHT CET 2024 11th May Morning Shift

Options:

A. $sp^3 d^2$

B. sp^3

C. sp^2

D. sp

Answer: B

Solution:

The central atom in the hydrides of group 16 elements (such as H_2O for oxygen, H_2S for sulfur, etc.) typically exhibits sp^3 hybridization.

Group 16 elements have the general electronic configuration of ns^2np^4. When forming hydrides, they generally undergo sp^3 hybridization to form four hybrid orbitals. Out of these four orbitals, two are used for bonding with hydrogen atoms and the other two contain lone pairs of electrons.

Hence, the correct option is:

Option B

sp^3

Question23

Which among the following P-block elements forms colourless and odourless hydride?

MHT CET 2024 11th May Morning Shift

Options:

A. Oxygen

B. Nitrogen

C. Sulphur

D. Selenium

Answer: A

Solution:

Correct Answer: Option A (Oxygen)

Oxygen: Its hydride is water (H_2O), which is a colorless, odorless liquid.

Nitrogen: Its hydride is ammonia (NH_3), which is colorless but has a strong, pungent odor.

Sulphur: Its hydride is hydrogen sulfide (H_2S), which is colorless but has a distinct, rotten-egg smell.

Selenium: Its hydride is hydrogen selenide (H_2Se), which has an extremely unpleasant odor.

Only oxygen forms a hydride (water) that is both colorless and odorless.

Question24

Which from following elements is NOT a member of group 16 from periodic table?

MHT CET 2024 10th May Evening Shift

Options:

A. Tellurium

B. Selenium

C. Polonium

D. Astatine

Answer: D

Solution:

Option D, Astatine, is not a member of Group 16 in the periodic table. Group 16, also known as the chalcogens, includes Oxygen, Sulfur, Selenium (Option B), Tellurium (Option A), and Polonium (Option C). Astatine belongs to Group 17, which is the halogen group.

Question25

Which from following compounds is NOT in solid state at $25^{\circ}C$?

MHT CET 2024 4th May Evening Shift

Options:

A. ICI

B. IBr

C. IF_3

D. IF_5

Answer: D

Solution:

States of interhalogen compounds at $25^{\circ}C$:

ICl - Ruby red or brown red solid

IBr -Black solid

IF_3 - Yellow powder

IF_5 - Colourless gas

Question26

Identify the correct decreasing order of thermal stability from following.

MHT CET 2024 3rd May Evening Shift

Options:

A. $CF > ICl > Br > BrCl$

B. $BrCl > Br > ICl > ClF$

C. $CF > Br > BrCl > ICl$

D. $ClF > BrCl > Br > ClF$

Answer: A

Solution:

Understanding Thermal Stability

Thermal stability of a compound generally correlates with the strength of its bonds:

Stronger bonds imply **higher thermal stability**, meaning the compound can withstand higher temperatures without decomposing.

Weaker bonds imply **lower thermal stability**, making the compound more prone to decomposition at lower temperatures.

Given Compounds and Their Bond Energies

Let's consider the bond energies (approximate values) of the relevant bonds:

C-F (Carbon-Fluorine): ~485 kJ/mol

Highly strong bond contributing to high thermal stability.

Cl-F (Chlorine-Fluoride): ~243 kJ/mol

Strong bond, high thermal stability.

I-Cl (Iodine-Chlorine): ~206 kJ/mol

Moderately strong bond.

Br-Cl (Bromine-Chlorine): ~193 kJ/mol

Weaker than I-Cl.

Br-Br (Bromine-Bromine): ~193 kJ/mol

Similar to Br-Cl, weaker bond.

Analyzing Each Option

Option A:

$\mathrm{CF} > \mathrm{ICl} > \mathrm{Br} > \mathrm{BrCl}$

CF (Carbon-Fluorine) has the strongest bond, making it the most thermally stable.

ICl has a stronger bond than **Br** (Bromine) and **BrCl** (Bromine-Chlorine).

Br (Bromine) has a bond strength similar to **BrCl**, but placing **Br** above **BrCl** is reasonable based on bond energies.

Option B:

$\mathrm{BrCl} > \mathrm{Br} > \mathrm{ICl} > \mathrm{ClF}$

ClF has a stronger bond than **ICl**, so placing **ClF** below **ICl** is incorrect.

This option incorrectly orders **ClF** as less stable than **ICl**.

Option C:

$CF > Br > BrCl > ICl$

ICl has a stronger bond than both **Br** and **BrCl**, so placing **ICl** last is incorrect.

Option D:

$ClF > BrCl > Br > ClF$

ClF is listed twice, which is likely a typographical error.

Even if corrected, the ordering doesn't align with bond strengths.

Conclusion

Option A correctly represents the decreasing order of thermal stability based on bond strengths:

$CF > ICl > Br > BrCl$

Answer:

Option A

Question27

Which of the following compounds is amphoteric in nature?

MHT CET 2024 3rd May Evening Shift

Options:

A. HCl

B. H_2O

C. CH_3COOH

D. $NaOH$

Answer: B

Solution:

Water can act as an acid as well as a base. Therefore, it is amphoteric.

E.g. $\underset{(\text{Acid})}{H_2O_{(t)}} + NH_{3(aq)} \rightleftharpoons OH^-_{(aq)} + NH^+_{4(aq)}$

$$\underset{\text{(Base)}}{H_2O_{(l)}} + HCl_{(aq)} \rightleftharpoons H_3O^+_{(aq)} + Cl^-_{(aq)}$$

Question28

What is the number of moles of sulfur atoms present in n mole molecules of mustard gas?

MHT CET 2024 2nd May Evening Shift

Options:

A. n

B. 3n

C. 2n

D. 4n

Answer: A

Solution:

Chemical formula of mustard gas is $ClCH_2CH_2SCH_2CH_2Cl$

$\therefore$ $'n'$ mol $ClCH_2CH_2SCH_2CH_2Cl \equiv$ n mol S-atom

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Question29

Identify a compound having highest thermal stability.

MHT CET 2024 2nd May Evening Shift

Options:

A. ICl

B. BrCl

C. BrF

D. ClF

Answer: D

Solution:

Thermal stability of interhalogen compounds decreases in the order:

decreases in $ClF > ICl > IBr > BrCl > BrF$

Hence, the compound having highest thermal stability is CIF.

Question30

Which of the following compounds contains chlorine in +5 oxidation state?

MHT CET 2024 2nd May Evening Shift

Options:

A. $HClO_4$

B. $HClO_2$

C. $HClO_3$

D. HCl

Answer: C

Solution:

Compounds	Oxidation state of chlorine
$HClO_4$	+7
$HClO_2$	+3

Compounds	Oxidation state of chlorine
$HClO_3$	+5
HCl	−1

Question31

Identify the element having outer electronic configuration ns^2np^5.

MHT CET 2024 2nd May Morning Shift

Options:

A. I

B. Te

C. Ar

D. Ne

Answer: A

Solution:

The outer electronic configuration ns^2np^5 is characteristic of elements in Group 17 of the periodic table, known as halogens. These elements have seven electrons in their outermost shell, thus needing only one more electron to complete their octet, making them highly reactive.

Given the options:

Option A: I (Iodine) - Iodine is a halogen.

Option B: Te (Tellurium) - Tellurium belongs to Group 16.

Option C: Ar (Argon) - Argon is a noble gas in Group 18.

Option D: Ne (Neon) - Neon is also a noble gas in Group 18.

The correct answer is **Option A: I (Iodine)**, as it is the only halogen listed, matching the ns^2np^5 configuration.

Question32

What is the value of $\angle S - S - S$ in puckered S_8 rhombic sulfur?

MHT CET 2023 14th May Morning Shift

Options:

A. 107°

B. 120°

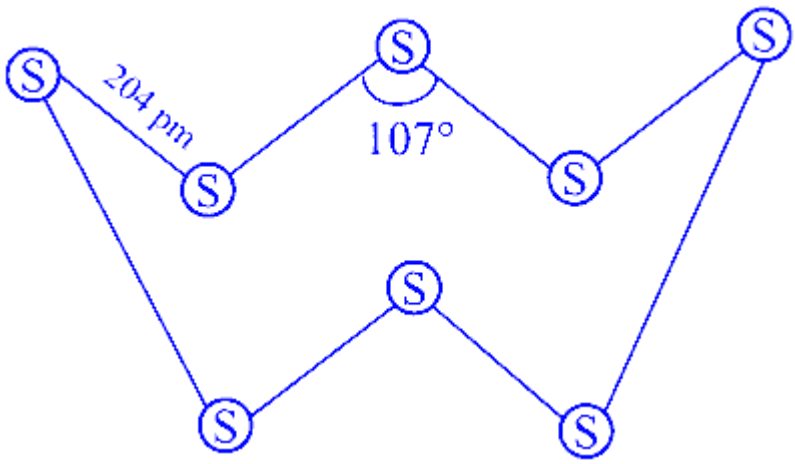
C. 104.5°

D. 60°

Answer: A

Solution:

Structure of S_8 ring in rhombic sulfur:



Question33

Which element from following exhibits the highest number of allotropes?

MHT CET 2023 14th May Morning Shift

Options:

A. O

B. S

C. Se

D. Te

Answer: B

Solution:

The element sulfur (S), option B, exhibits the highest number of allotropes among the options provided. Allotropy is the existence of two or more different forms of an element in the same physical state. Allotropes differ in the structure of the atoms and the type of bonding between them, resulting in different physical and chemical properties.

Sulfur is known to have several allotropes, with the most common one being rhombic sulfur (also known as α-sulfur), which consists of S_8 rings and is stable at room temperature. Another common allotrope is monoclinic sulfur (or β-sulfur), which also consists of S_8 rings but forms at temperatures above 95.6 degrees Celsius. Beyond these, sulfur can form several other polymeric forms, including various chain lengths and rings with different numbers of sulfur atoms.

In comparison, oxygen (O), selenium (Se), and tellurium (Te) exhibit fewer allotropes. For example:

- Oxygen primarily exists as O_2 (dioxygen) and O_3 (ozone).
- Selenium has a few allotropes, including red selenium (with chain-like structures) and gray selenium (with helical structures similar to S_8 but with more atoms per ring).
- Tellurium typically does not exhibit allotropy in the same way as the lighter chalcogens.

Therefore, sulfur (S), with its multiple allotropes, is the element that exhibits the highest number of allotropes among the options provided. Thus, Option B is the correct answer.

Question34

Which element from following does NOT belong to chalcogen family?

MHT CET 2023 13th May Evening Shift

Options:

A. At

B. Po

C. Se

D. Te

Answer: A

Solution:

Members of oxygen family are commonly called as chalcogen family. Their members are oxygen (O), sulphur (S), selenium (Se), tellurium (Te), polonium(Po). Thus, among the given options (At) astatinedoes not belongs to group 16 or chalcogen family.

Question35

Which noble gas element from following exhibits highest number of different oxidation states?

MHT CET 2023 13th May Morning Shift

Options:

A. Xe

B. Kr

C. Ar

D. Ne

Answer: A

Solution:

Xenon has large atomic size and lower ionisation enthalpy compared to He, Ne, Ar and Kr. Hence, xenon exhibits highest number of different oxidation states.

Question36

Which among the following compounds exhibits +2 oxidation state of oxygen?

MHT CET 2023 12th May Morning Shift

Options:

A. H_2O

B. SO_2

C. OF_2

D. H_2O_2

Answer: C

Solution:

The oxidation number of F is -1 in all of its compounds. Hence, in OF_2 oxidation number of oxygen is +2.

Question37

Identify the element having highest density from following.

MHT CET 2023 12th May Morning Shift

Options:

A. O

B. S

C. Se

D. Te

Answer: D

Solution:

In group 16, density increases down the group.

Question38

Which from following molecules exhibits lowest thermal stability?

MHT CET 2023 11th May Evening Shift

Options:

A. H_2O

B. H_2Te

C. H_2Se

D. H_2S

Answer: B

Solution:

The thermal stability of hydrides of group 16 elements decreases from H_2O to H_2Te.

Question39

Identify weakest halogen acid from following.

MHT CET 2023 11th May Evening Shift

Options:

A. HCl

B. HI

C. HF

D. HBr

Answer: C

Solution:

Acidic strength of halogen acids increases in the order : $HF < HCl < HBr < HI$

Hence, the weakest halogen acid is HF.

Question40

Identify strongest oxoacid of halogen from following.

MHT CET 2023 10th May Morning Shift

Options:

A. Hypochlorous acid

B. Chlorous acid

C. Chloric acid

D. Perchloric acid

Answer: D

Solution:

Increasing order of acid strength is: $HOCl < HClO_2 < HClO_3 < HClO_4$

Hence, perchloric acid $(HClO_4)$ is the strongest acid, among the oxoacids of chlorine.

Question41

Which from following molecules exhibits highest acidic nature?

MHT CET 2023 9th May Morning Shift

Options:

A. H_2O

B. H_2S

C. H_2Se

D. H_2Te

Answer: D

Solution:

The acidic character of the hydrides of group 16 increases from H_2O to H_2Te.

Question42

Which among the following compounds contains highest number of chlorine atoms in their single molecule ?

MHT CET 2022 11th August Evening Shift

Options:

A. Mustard gas

B. Phosgene

C. Tear gas

D. Phosphine

Answer: C

Solution:

Tear gas $CCl_3(NO_2)$ contains three Cl-atoms.

Question43

Which among following compounds of chlorine possesses Cl atom in highest oxidation state?

MHT CET 2021 24th September Evening Shift

Options:

A. Chlorous acid

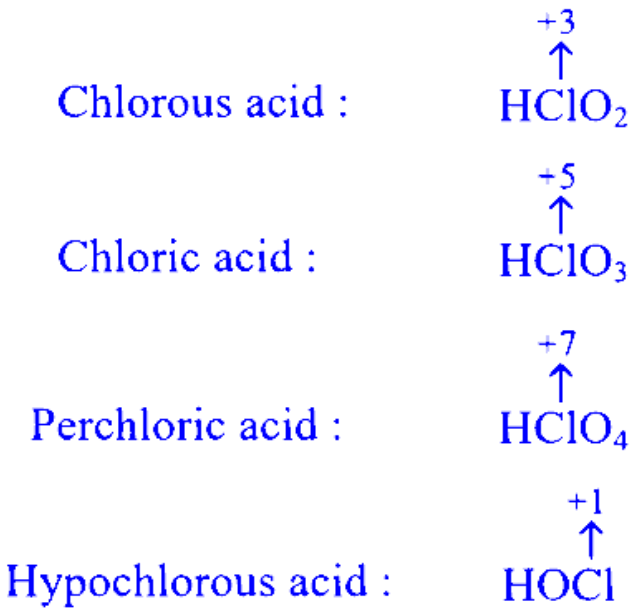
B. Chloric acid

C. Perchloric acid

D. Hypochlorous acid

Answer: C

Solution:



Question44

Which element from following combines with hydrogen to form compound having lowest acidic strength?

MHT CET 2021 24th September Morning Shift

Options:

A. Cl

B. Br

C. F

D. I

Answer: C

Solution:

To determine which element combines with hydrogen to form a compound with the lowest acidic strength, we need to consider the strength of the hydrohalic acids (HX), where X can be Cl, Br, F, or I. The acidic

strength of these acids is influenced by the bond strength between hydrogen and the halogen, and the stability of the halide ion (X^-) after the dissociation of the acid in water.

As we move down the halogen group in the periodic table, the bond strength between hydrogen and the halogen decreases. This means that it becomes easier to dissociate the molecules into H^+ and X^- ions, which generally indicates a stronger acid. Thus, we expect the acidic strength to follow the trend: HF < HCl < HBr < HI.

Among HF, HCl, HBr, and HI, hydrofluoric acid (HF) has the strongest bond between hydrogen and fluorine, making it the least likely to dissociate into ions. This results in HF being the weakest acid among them.

Therefore, the element that combines with hydrogen to form the compound with the lowest acidic strength is fluorine (Option C).

Question45

Which from following statements is true for group 16 elements?

MHT CET 2021 23th September Morning Shift

Options:

A. All elements of this group form EO_2 type oxides.

B. It includes all the nonmetals.

C. Oxides of all elements of this group are gaseous at room temperature.

D. Reducing properties of dioxides of this group element decreases form SO_2 to TeO_2.

Answer: D

Solution:

The correct answer is **Option D**: Reducing properties of dioxides of this group element decreases form SO_2 to TeO_2.

Let's analyze each option:

Option A: All elements of this group form EO_2 type oxides. This statement is **not entirely true**. While most elements in group 16 (oxygen, sulfur, selenium, tellurium, and polonium) can form dioxides (EO_2), oxygen itself cannot form a dioxide with itself, as it forms a diatomic molecule (O_2). Therefore, not all elements in group 16 form EO_2 type oxides.

Option B: It includes all the nonmetals. This statement is **false**. Group 16 contains both nonmetals (oxygen, sulfur, selenium) and metalloids (tellurium and polonium).

Option C: Oxides of all elements of this group are gaseous at room temperature. This statement is **false**. While sulfur dioxide (SO_2) is a gas at room temperature, oxides of other elements in group 16, like selenium dioxide (SeO_2) and tellurium dioxide (TeO_2) are solids at room temperature.

Option D: Reducing properties of dioxides of this group element decreases form SO_2 to TeO_2. This statement is **true**. As we move down group 16, the metallic character of elements increases, and their electronegativity decreases. This results in a decrease in the oxidizing power of their dioxides. Therefore, the reducing property of the dioxides increases as we move down the group. So, SO_2 is a stronger reducing agent than TeO_2.

In summary, only **Option D** accurately describes the properties of group 16 elements.

Question46

Which among the following compounds in NOT a colourless gas?

MHT CET 2021 22th September Evening Shift

Options:

A. CIF

B. IF_7

C. IF_3

D. CIF_3

Answer: C

Solution:

The question you've asked pertains to the physical characteristics, specifically color, of different halogen compounds. To determine which of the listed compounds is not a colorless gas, we need to understand a bit about each compound's properties.

- **CIF (Chlorine Monofluoride)**: Chlorine monofluoride is indeed a gas at room temperature and is colorless. It is a reactive halogen compound that forms when chlorine gas reacts with fluorine gas under certain conditions.

- IF_7 **(Iodine Heptafluoride)**: Iodine heptafluoride is also a gas at room temperature and is colorless. It is known for its molecular geometry, which is pentagonal bipyramidal, and is one of the few compounds of iodine that exists in the gaseous state at room temperature.

- IF_3 **(Iodine Trifluoride)**: Iodine trifluoride is a yellow solid at room temperature. It does not exist as a gas under standard conditions and is known for its reactivity and potential use in various chemical syntheses. Hence, IF_3 does not meet the criteria of being a colorless gas.

- ClF_3 **(Chlorine Trifluoride)**: Chlorine trifluoride is a colorless, poisonous, corrosive, and extremely reactive gas that can spontaneously ignite or explode on contact with many materials. Despite its hazardous nature, it meets the criteria of being a colorless gas.

Therefore, the compound among the options that is NOT a colorless gas is **Option C:** IF_3 **(Iodine Trifluoride)**, which is a yellow solid at room temperature.

Question47

Identify use of argon from following.

MHT CET 2021 22th September Evening Shift

Options:

A. In supersonic wind tunnels

B. For magnetic resonance imaging

C. For producing inert atmosphere in welding

D. For production of lasers

Answer: C

Solution:

From the options provided, the use of argon that stands out is for producing an inert atmosphere in welding, which corresponds to Option C. Argon is a noble gas, which means it is chemically inert and does not react easily with other substances. This property makes it extremely valuable in processes where materials need to be protected from the atmospheric gases that might otherwise react with them.

In the context of welding, argon is used as a shielding gas in processes like gas tungsten arc welding (GTAW) and gas metal arc welding (GMAW). The primary role of argon here is to protect the weld area from atmospheric gases, such as oxygen, nitrogen, and water vapor. These gases could cause oxidation, porosity, and other defects in the weld if allowed to come into contact with the molten metal. By creating an inert atmosphere, argon ensures that the integrity of the weld is maintained, and the resulting joins are strong and clean.

Although argon is not directly used for production of lasers (Option D), magnetic resonance imaging (Option B), or in supersonic wind tunnels (Option A), it does play a critical role in other areas beyond welding, such as the manufacturing of electronics where it provides an inert atmosphere for the growth of silicon and germanium crystals. However, the context provided directly matches with its use in welding as the best and most direct application among the given options.

Question48

Which element from following belongs to oxygen family?

MHT CET 2021 22th September Morning Shift

Options:

A. Ba

B. Se

C. Rb

D. Ca

Answer: B

Solution:

The oxygen family, also known as the chalcogens, consists of elements found in Group 16 of the periodic table. These elements typically have six valence electrons and share similar chemical properties. The elements in this family include oxygen (O), sulfur (S), selenium (Se), tellurium (Te), and polonium (Po).

Now, let's analyze the given options:

Option A: Ba

Barium (Ba) belongs to Group 2, which is the alkaline earth metals group.

Option B: Se

Selenium (Se) belongs to Group 16, which is the oxygen family (chalcogens).

Option C: Rb

Rubidium (Rb) belongs to Group 1, which is the alkali metals group.

Option D: Ca

Calcium (Ca) belongs to Group 2, which is the alkaline earth metals group.

Based on the information above, the element that belongs to the oxygen family is:

Option B: Selenium (Se)

Question49

Oxidation state of iodine in I_3^- is

MHT CET 2021 21th September Evening Shift

Options:

A. $-(1/3)$

B. +4

C. +5

D. -3

Answer: A

Solution:

Consider, oxidation state of $I = x$

$I_3^- \Rightarrow 3x = -1$

$\therefore x = -\frac{1}{3}$

Question50

Which among the following noble gases reacts with fluorine to give crystalline fluorides?

MHT CET 2021 21th September Evening Shift

Options:

A. Ne

B. He

C. Xe

D. Ar

Answer: C

Solution:

The correct answer is: **C. Xe (Xenon)**

Explanation:
Among noble gases, **xenon** is sufficiently reactive to form **stable, crystalline fluorides** such as **XeF_2, XeF_4, and XeF_6** when it reacts with fluorine.
Other noble gases like **He, Ne, and Ar** do not form stable fluorides under normal conditions.

✔ **Xenon**

Question51

Which among the following is NOT the use of SO_2 gas?

MHT CET 2021 20th September Evening Shift

Options:

A. As a preservative

B. In manufacture of H_2SO_4

C. With conc. H_2SO_4 it forms oleum

D. As an antichlor

Answer: C

Solution:

The statement:

Option C : "With conc. H_2SO_4 it forms oleum" is incorrect.

In reality, oleum (or fuming sulfuric acid) is formed when SO_3 gas is dissolved in concentrated H_2SO_4, not SO_2 gas.

Question52

What is the number of allotropes of selenium?

MHT CET 2021 20th September Morning Shift

Options:

A. 2

B. 4

C. 5

D. 6

Answer: A

Solution:

Selenium exists in two allotropic forms, red (non-metallic) and grey (metallic).

Question53

Which from following elements of halogen family is in liquid state at room temperature?

MHT CET 2021 20th September Morning Shift

Options:

A. Iodine

B. Astatine

C. Bromine

D. Fluorine

Answer: C

Solution:

At room temperature :

Option A : Iodine is a solid.

Option B : Astatine is a radioactive element and is thought to be a metalloid, but not much is known about its standard state due to its extreme rarity and radioactivity. However, it's not known to be a liquid at room temperature.

Option C : Bromine is a liquid.

Option D : Fluorine is a gas.

Thus, the element from the halogen family that is in liquid state at room temperature is :

Option C : Bromine.

Question54

Which of the following oxyacids of sulphur contain four $S = O$ bonds?

MHT CET 2020 19th October Evening Shift

Options:

A. H_2SO_5

B. $H_2S_2O_4$

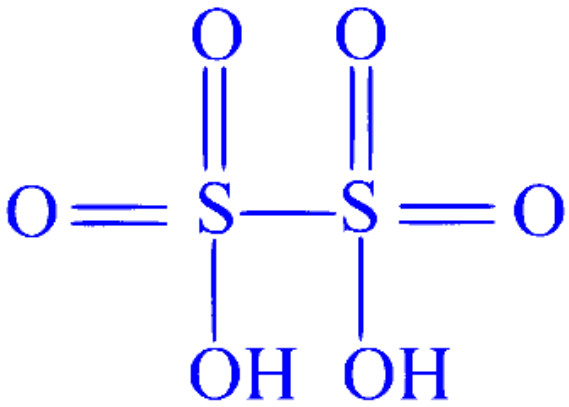
C. H_2SO_4

D. $H_2S_2O_6$

Answer: D

Solution:

$H_2S_2O_6$ oxyacids of sulphur contain four S = O bonds. It is shown as below:



Dithionic acid ($H_2S_2O_6$)

Question55

Which of the following molecular formula represents Marshall's acid?

MHT CET 2020 19th October Evening Shift

Options:

A. $H_2S_2O_7$

B. $H_2S_2O_8$

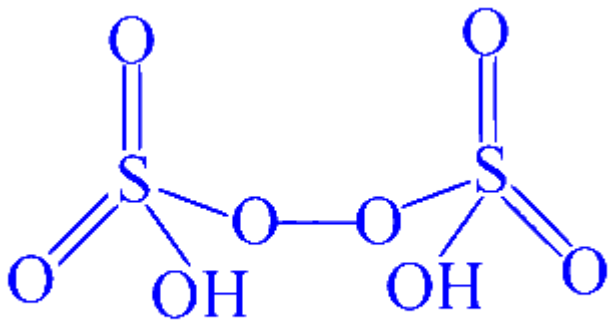
C. $H_2S_2O_6$

D. H_2SO_5

Answer: B

Solution:

Peroxodisulphuric acid $(H_2S_2O_8)$ represents Marshall's acid. It is a inorganic compound. It contain sulphur in its +6 oxidation state and a peroxide group. It's structure is as follows:



Peroxodisulphuric acid $(H_2S_2O_8)$

Question56

What is the highest oxidation state possessed by phosphorus in it's oxyacids?

MHT CET 2020 19th October Evening Shift

Options:

A. +5

B. +3

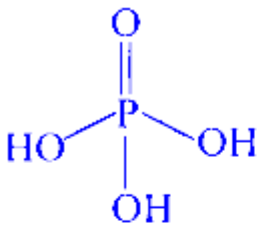
C. +6

D. +4

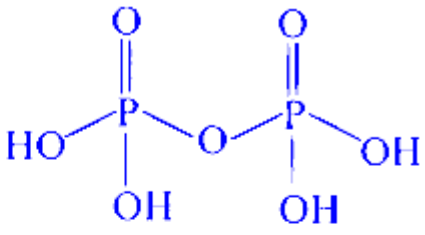
Answer: A

Solution:

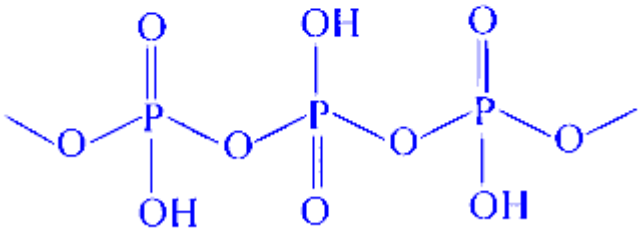
+5 is the highest oxidation state possessed by phosphorus in it's oxyacids. In oxoacids phosphorus is tetrahedrally surrounded by other atoms. All these acid contains at least one $P=0$ bond and one $\mathrm{P-OH}$ bond. The oxoacids in which phosphorus has maximum oxidation state (+5) is orthophosphoric (H_3PO_4), pyrophosphoric $(H_4P_2O_7)$ and metaphosphoric $(HPO_3)_n$.



H_3PO_4



$H_3P_2O_7$



$(HPO_3)_n$

Question57

Which of the following is obtained by catalytic oxidation of ammonia?

MHT CET 2020 16th October Evening Shift

Options:

A. N_2O

B. NO

C. HNO_2

D. NO_2

Answer: B

Solution:

Nitric oxide (NO) is obtained by catalytic. oxidation of ammonia. The catalytic oxidation of ammonia uses a metal catalyst such as platinum, copper or nickel. This metal catalyst is heated, so that ammonia can reduce it, oxygen added to the system can then oxidise the ammonia, forming nitric oxide.

$$4NH_3 + 5O_2 \xrightarrow[800-900^{\circ}C]{\text{Pl gauge}} 4NO + 6H_2O; +21.5 \text{ kcal}$$

Question58

Which of the following reaction proves the chlorinating property of phosphorus pentachloride?

MHT CET 2020 16th October Evening Shift

Options:

A. $PCl_5 + H_2O \longrightarrow POCl_3 + 2HCl$

B. $2PCl_5 + Sn \longrightarrow SnCl_4 + 2PCl_3$

C. $PCl_5 \longrightarrow PCl_3 + Cl_2$

D. $P_4 + 10Cl_2 \longrightarrow 4PCl_5$

Answer: C

Solution:

Phosphorus pentachloride has a trigonal bipyramidal shape in which $P-Cl$ (axial) bonds are slightly larger than the $P-Cl$ (equatorial) bonds, this makes the molecule rather unstable, li dissociates to lose two chlorine atoms involved in the axial bond and acts as a chlorinating agent,

$PCl_5 \longrightarrow PCl_3 + Cl_2 \longrightarrow$ act as chlorinating agent

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Question59

How many numbers of $P-OH$ and $P-O-P$ bonds are present in pyrophosphoric acid respectively?

MHT CET 2020 16th October Evening Shift

Options:

A. 4, 1

B. 3, 3

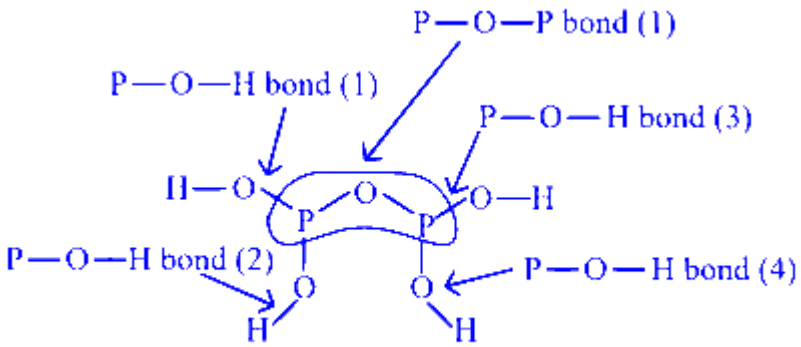
C. 4, 3

D. 3, 1

Answer: A

Solution:

In pyrophosphoric acid, the number of P – O – H and P – O – P bonds respectively are 4 and 1.



Pyrophosphorus acid

Pyrophosphoric acid also known as diphosphoric acid, is the inorganic compound with the formula $H_4P_2O_7$.

Question60

Which among the following is non-poisonous in nature?

MHT CET 2020 16th October Morning Shift

Options:

A. Phosgene

B. Gaseous chlorine

C. Red phosphorus

D. Phosphine

Answer: C

Solution:

Among the listed options, the one that is non-poisonous in nature is **Option C: Red phosphorus**.

Let's briefly explore the nature of each substance to understand why:

- **Phosgene (Option A):** Phosgene is a highly toxic gas. It has been used as a chemical weapon during World War I. It is extremely dangerous and can cause severe respiratory distress when inhaled.
- **Gaseous chlorine (Option B):** Chlorine gas is also highly poisonous. It is a greenish-yellow gas with a choking smell and is known to be used in chemical warfare as well. Chlorine gas can cause damage to the skin, eyes, and respiratory system upon exposure.
- **Red phosphorus (Option C):** Red phosphorus is the correct answer. It is relatively safe and is non-toxic under normal conditions. Red phosphorus is used in safety matches, fireworks, and as a flame retardant. While it is flammable, it does not emit toxic fumes like some other forms of phosphorus, making it non-poisonous in nature.
- **Phosphine (Option D):** Phosphine is a highly toxic and flammable gas. It smells like garlic or decaying fish and is used as a pesticide. Phosphine exposure can lead to symptoms such as nausea, vomiting, abdominal pain, and in severe cases, pulmonary edema or death.

Hence, Red phosphorus is the safest among the options listed, specifically regarding its non-poisonous nature under typical conditions.

Question61

Which among the following pairs of halogen forms the interhalogen compound of the type XX'_7 ?

MHT CET 2020 16th October Morning Shift

Options:

A. Cl and F

B. I and F

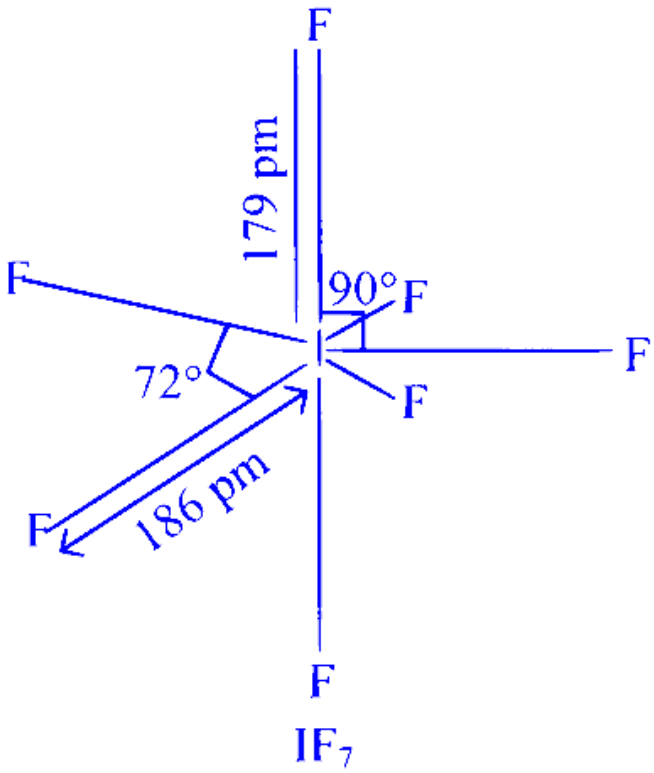
C. I and Cl

D. Br and F

Answer: B

Solution:

Iodine (I) and fluorine (F) pairs of halogen forms the interhalogen compound of the type XX_7', that is iodine heptafluoride with the chemical formula IF_7. It has an unusual pentagonal bipyramidal structure, as predicted by VSEPR theory.



Question62

Which among the following group-15 elements does not react with concentrated sulphuric acid?

MHT CET 2020 16th October Morning Shift

Options:

A. Phosphorus

B. Arsenic

C. Antimony

D. Nitrogen

Answer: D

Solution:

Nitrogen does not react with concentrated sulphuric acid because in the above option only nitrogen have tendency to form triple bond and having maximum dissociation energy.

Question63

The element which does not belong to group 15 is

MHT CET 2019 3rd May Morning Shift

Options:

A. As

B. P

C. Bi

D. Se

Answer: D

Solution:

The element which does not belong to group 15 is Se (selenium). It belongs to group 16 of the periodic table. It resides in 4 th period and 16 th group having atomic number 34 . Electronic configuration of Se is $4s^2 4p^4$.

Question64

Which of the following metal halide is more covalent?

MHT CET 2019 3rd May Morning Shift

Options:

A. $SnCl_2$

B. $PbCl_2$

C. $SbCl_3$

D. $SbCl_5$

Answer: D

Solution:

$SbCl_5$ metal halide is more covalent than other given options. It can be explained on the basis of Fajan's rule. Higher the charge on the cation, greater is its polarising power. In $SbCl_5$, Antimony Sb) is in +5 oxidation state. It has maximum polarising power. Hence, possess higher covalent character.

Question65

Which of the following is also called as nitrogen sesquioxide?

MHT CET 2019 2nd May Evening Shift

Options:

A. NO_2

B. N_2O_3

C. N_2O_4

D. N_2O_5

Answer: B

Solution:

The correct answer is **Option B,** N_2O_3.

Here's why:

Sesquioxide refers to an oxide where the ratio of the non-metal (in this case, nitrogen) to oxygen is 2:3.

In N_2O_3, there are two nitrogen atoms and three oxygen atoms, perfectly matching the 2:3 ratio.

Let's look at the other options:

Option A, NO_2 is nitrogen dioxide, not a sesquioxide.

Option C, N_2O_4 is dinitrogen tetroxide, also not a sesquioxide.

Option D, N_2O_5 is dinitrogen pentoxide, again not a sesquioxide.

Therefore, only N_2O_3 fits the definition of a sesquioxide and is correctly named nitrogen sesquioxide.

Question66

Which among the following does not form polyhalide ion?

MHT CET 2019 2nd May Evening Shift

Options:

A. Chlorine

B. Bromine

C. Iodine

D. Fluorine

Answer: D

Solution:

When the halide ions combine with halogen molecules or interhalogen, univalent ions are obtained. These are known as polyhalide ions. Among the given options, F doesn't form polyhalide ion because it doesn't have d-orbitals and cannot show higher oxidation state.

Question67

In which oxidation state, group 15 elements act as Lewis base?

MHT CET 2019 2nd May Evening Shift

Options:

A. +5

B. +4

C. −3

D. +3

Answer: C

Solution:

Group 15 elements acts as Lewis base in −3 oxidation state due to availability of lone pair of electrons on the central atom. This basic character of group 15 decreases down the group with an increase in the size of the central atom.

Question68

Which of following elements does not react with hot concentrated sulphuric acid?

MHT CET 2019 2nd May Evening Shift

Options:

A. Sb

B. N

C. P

D. As

Answer: B

Solution:

Nitrogen doesn't react with concentrated sulphuric acid as its bond dissociating energy is highest among the given elements. This is because of its small size.

Question69

What is the atomicity of aluminium phosphate?

MHT CET 2019 2nd May Evening Shift

Options:

A. 8

B. 6

C. 5

D. 13

Answer: B

Solution:

The chemical formula for aluminium phosphate is $AlPO_4$.

Atomicity of heternuclear molecule = total number of atoms present

$\therefore$ Atomicity of $AlPO_4 = 1 + 1 + 4 = 6$

Question70

When $CuSO_4$ solution in water is treated with concentrated HCl it turns

MHT CET 2019 2nd May Morning Shift

Options:

A. violet

B. yellow

C. purple

D. green

Answer: B

Solution:

When $CuSO_4$ solution in water is treated with conc. HCl , the deep blue solution slowly turns yellow-green due to the formation of copper chloride complex.

Question71

Which among the following group 15 elements does not exhibit allotropy?

MHT CET 2019 2nd May Morning Shift

Options:

A. N

B. As

C. Sb

D. Bi

Answer: D

Solution:

All the elements of group 15 except Bi show allotropy as nitrogen exists in two solid forms namely α-nitrogen and β-nitrogen. Phosphorus exists in a number of allotropic forms. As exists as grey, yellow and black arsenic and Sb exists as metallic, α and β-antimony.

Question72

Which among the following oxides of nitrogen is called nitrogen sesquioxide?

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Options:

A. NO_2

B. N_2O_3

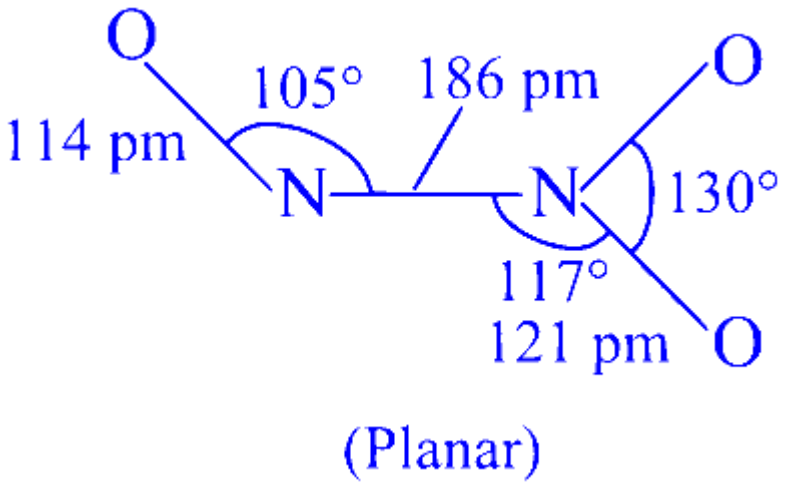
C. N_2O_4

D. N_2O_5

Answer: B

Solution:

Among the following oxides of nitrogen, nitrogen sesquioxide is N_2O_3 (i.e. Dinitrogen trioxide). Its structure is shown below.



(Planar)

Question73

Which of following is not a property of red phosphorus?

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Options:

A. Insoluble in carbon disulphide

B. It does not show chemiluminescence by action of air

C. It forms phosphine when treated with hot sodium hydroxide solution

D. It is non-poisonous

Answer: C

Solution:

Red phosphorus possess iron grey lustre. It is odourless, non-poisonous and insoluble in water as in carbon disulphide. It does not show chemalumiscence by action of air. Thus, the option (c) is correct.

Question74

Which hydride among the following is strongest reducing agent?

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Options:

A. AsH_3

B. BiH_3

C. PH_3

D. SbH_3

Answer: B

Solution:

Among the given hydrides of group 15 elements, BiH_3 is the strongest reducing agent, This is because as we move down the group, bond dissociation enthalpy decreases and thus reducing character increases.

Hence, the order is

$NH_3 < PH_3 < AsH_3 < SbH_3 < BiH_3$.
