

## Question



Elements of group-15 form compounds in +5 oxidation state. However, bismuth forms only one well characterized compound in +5 oxidation state. The compound is.....

1  $\text{Bi}_2\text{O}_5$

2  $\text{BiF}_5$



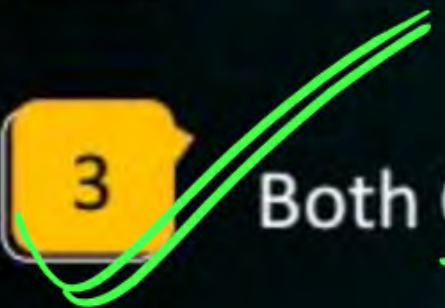
3  $\text{BiCl}_5$

4  $\text{Bi}_2\text{S}_5$

## Question



In the preparation of compounds of Xe, Bartlett had taken  $\text{O}_2^+\text{PtF}_6^-$  as a base compound. This is because .....

- 1 Both  $\text{O}_2$  and Xe have same size. 
- 2 Both  $\text{O}_2$  and Xe have same electron gain enthalpy 
- 3 Both  $\text{O}_2$  and Xe have almost same ionization enthalpy. 
- 4 Both Xe and  $\text{O}_2$  are gases.



Which of the following options are in accordance with the property mentioned against them?

1

$F_2 < Cl_2 > Br_2 > I_2$  (oxidizing power) ✗

2

$MI > MBr > MCl > MF$  (ionic character of metal halide) ✗

3

$F_2 > Cl_2 > Br_2 > I_2$  Bond dissociation enthalpy ✗

4

$HI < HBr < HCl < HF$  (Hydrogen-halogen bond strength) ✓

False

Which of the following statements are ~~true~~?

1

Only type of interactions between particles of noble gases are due to weak dispersion forces. ✓

2

Ionization enthalpy of molecular oxygen is very close to that of xenon. ✓

3

Hydrolysis of  $\text{XeF}_6$  is a redox reaction. ✗

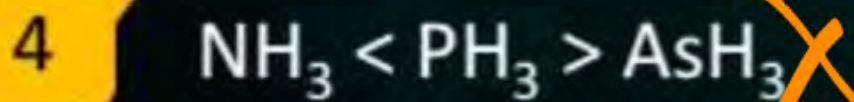
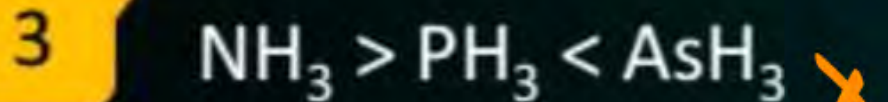
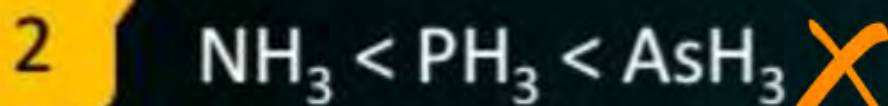
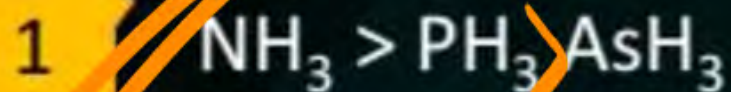
4

Xenon fluorides are not reactive. ✗

3, 4



Which of the following order regarding thermal stability of hydrides  $MH_3$  of group 15 is correct ?



Which of the following statements is not correct about oxides of group-16 ?

1

Reducing property of dioxide decreases from  $\overset{+4}{\text{SO}_2}$  to  $\overset{+4}{\text{TeO}_2}$ . ✓

$\text{SO}_2 \rightarrow \text{R.A}$

$\text{TeO}_2 \rightarrow \text{O.A}$

2

Acidic nature decreases from  $\text{SO}_3$  to  $\text{TeO}_3$ . ✓ acidic top to bottom ↓ se

3

S, Se and Te form both  $\text{EO}_2$  and  $\text{EO}_3$  types oxides. ✓

4

None of the above



## Question



Select interhalogen compound which is/are not exist ?

(i)  $\text{IF}_3$

~~(ii)  $\text{ClF}_7$~~

(iii)  $\text{ClF}_3$

(iv)  $\text{BrF}_4$

1

(i) and (iv)

2

(ii) and (iv)

3

(ii) Only

4

(ii) and (iii)

steric  
hindrance

X

$\text{BrF}_3$  ✓

$\text{BrF}_5$  ✓

## Question



Molecular size of I-Cl and Br<sub>2</sub> is nearly same but boiling point of I-Cl is about 40°C higher than Br<sub>2</sub>. This might be due to :

1 I-Cl bond is stronger than Br-Br-bond

2 Ionisation energy of I < I.E. of Br

3 I-Cl is polar whereas Br<sub>2</sub> is non-polar

4 Size of I > size of Br



Which of the following is not the characteristic of inter halogen compounds ?

1

The are more reactive than halogens

except  $F_2$

2

They are quite unstable but none of them is explosive

3

The are covalent in nature

4

They have low b.p. and high volatility

FIX

## Question



The incorrect match regarding above reaction is :

1  $\text{X}_2 = \text{I}_2$  ✓

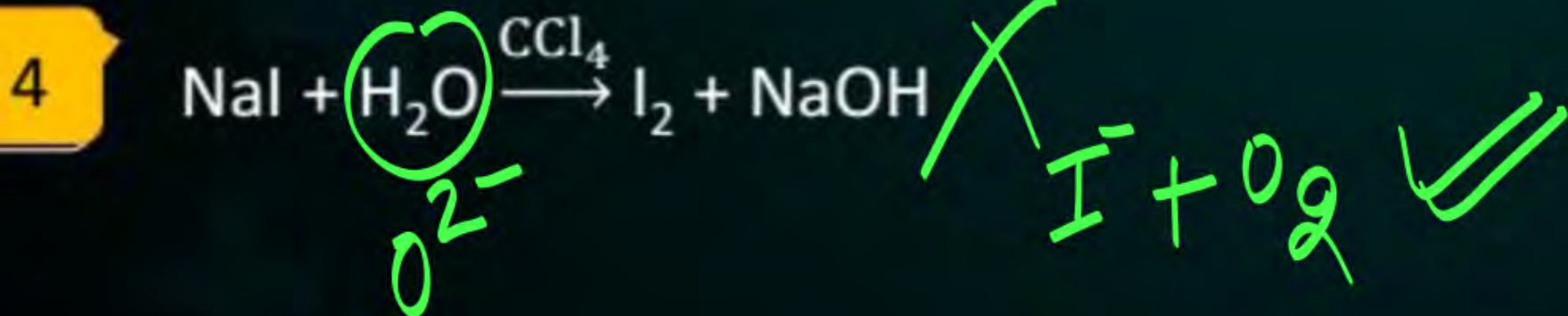
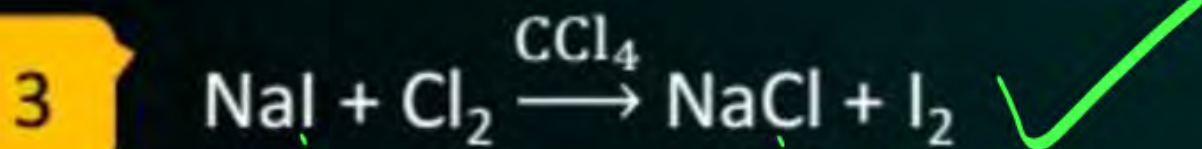
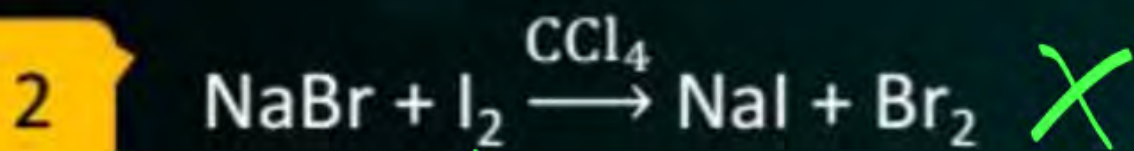
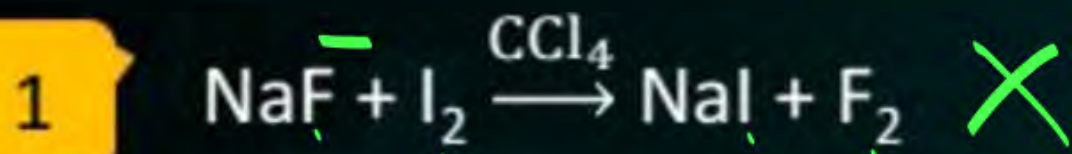
2  $\text{Y}_2 = \text{I}_2$  ✓

3  $\text{X}_2 = \text{Cl}_2$  ✗

4  $\text{Y}_2 = \text{Br}_2$  ✓



Correct reaction for layer test of I<sup>-</sup> ion is :



Which of the following halogen disproportionate in water ?

1  $F_2$

2  $Cl_2$

&  $Br_2$

3  $I_2$

4 All of these



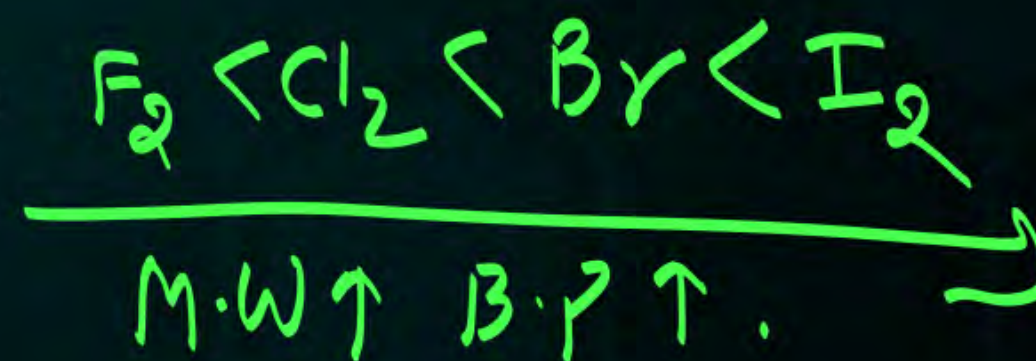
Which of the following is correct statement ?

1  $F_2$  has higher dissociation energy than  $Cl_2$  ✗

2 F has higher electron affinity than Cl ✗

3 HF is stronger acid than HCl. ✗

4 Boiling point increases down the group in halogens





## Question



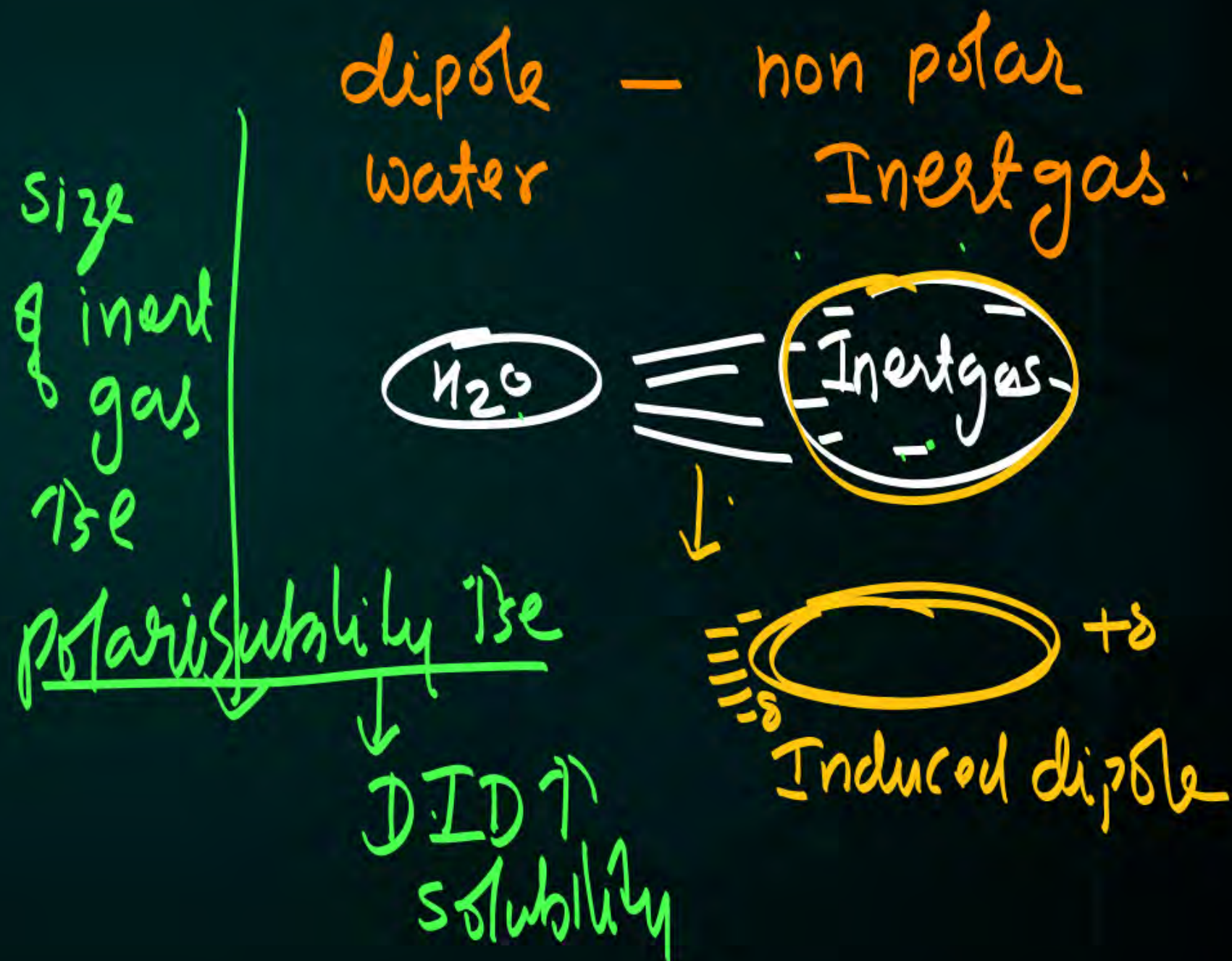
Which factor is most responsible for the increases in boiling points of noble gases from He to Xe ?

1 Decrease in I.E. ✗

2 Monoatomic nature ✗

3 Decrease in polarizability ✗

4 Increase in polarizability ✓

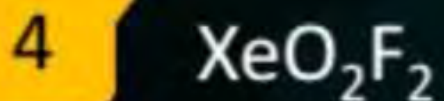
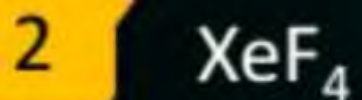




## Question



The compound that cannot be formed by xenon is :



**Xenon tetrafluoride,  $\text{XeF}_4$  is :**

1 Tetrahedral ~~and~~ acts as a fluoride donor with  $\text{SbF}_5$

2 Square planar and acts as a fluoride donor with  $\text{PF}_5$  ✓

3 Square planar and acts as fluoride donor with  $\text{NaF}$  ✗

4 See-saw shape and acts as a fluoride donot with  $\text{AsF}_5$  ✗

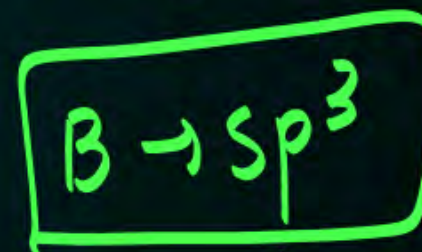


## Question



Select the correct statement for the sulphuric acid :

- (i) It has high boiling point and viscosity. ✓
- (ii) There are two types of bond lengths in its bivalent anion. ✗
- (iii)  $p\pi-d\pi$  bonding between Sulphur and oxygen is observed. ✓
- (iv) Sulphur has the same hybridization that is of boron in diborane. ✓



1 ii and iii only

2 i, iii and iv only

3 i, ii and iv only

4 ii and iv only



$\text{NF}_3 < \text{NCl}_3 < \text{NBr}_3 < \text{NI}_3$  is not correct order of

Unstable highly explosive

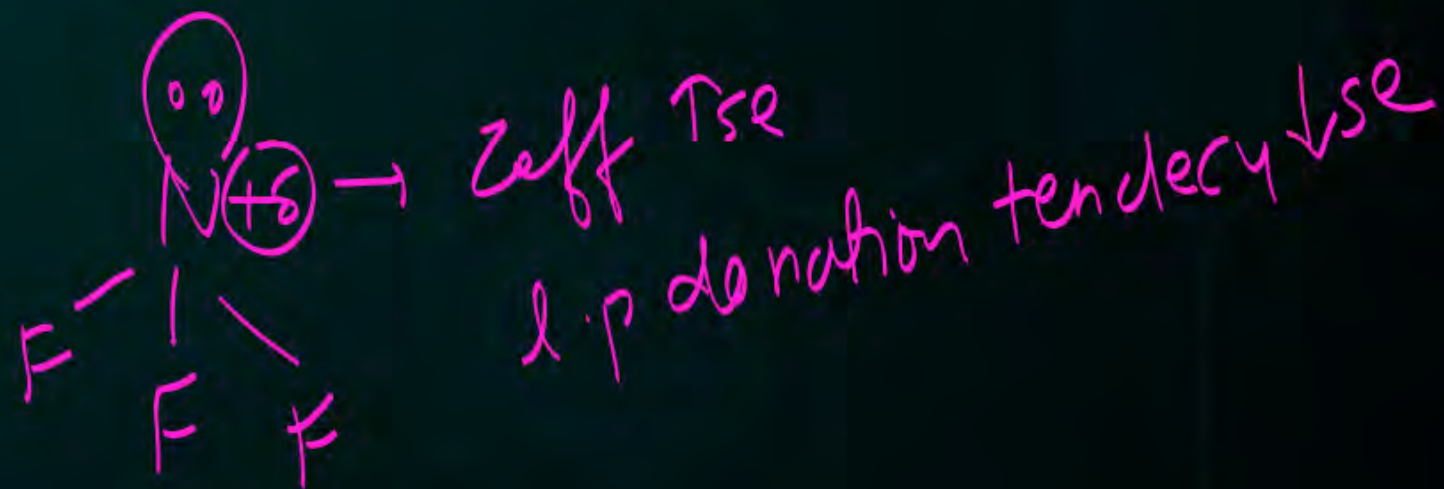
1 Stability ✗

2 Lewis basic strength ✓

3 Bond angle ✓

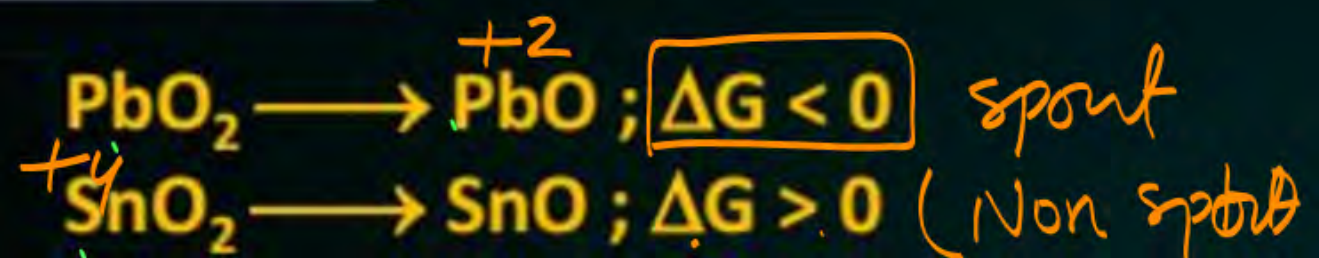
4 N-X bond length ✓

$\text{NF}_3$  Exist (stable)





## Question



Most probable oxidation state of Pb and Sn will be :

1  $\text{Pb}^{4+}, \text{Sn}^{4+}$

2  $\text{Pb}^{4+}, \text{Sn}^{2+}$

3  $\text{Pb}^{2+}, \text{Sn}^{2+}$

4  $\text{Pb}^{2+}, \text{Sn}^{4+}$

Structure of  $\text{PF}_5$  molecule is :

1

Trigonal bipyramidal

$\text{AB}_5\text{Lo}$

2

Pentagonal bipyramidal

3

Square planar

4

Tetrahedral



In the ground state of phosphorus, total number of unpaired electrons are :

1

3

2


5

3

8

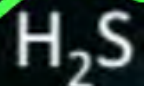
4

9



Which of the following sulphur containing species cannot act as oxidizing agent ?

1

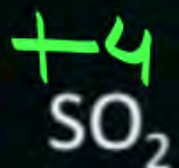


$\text{S}^{2-}$  O.A. X X

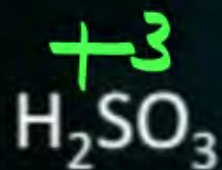
2



3



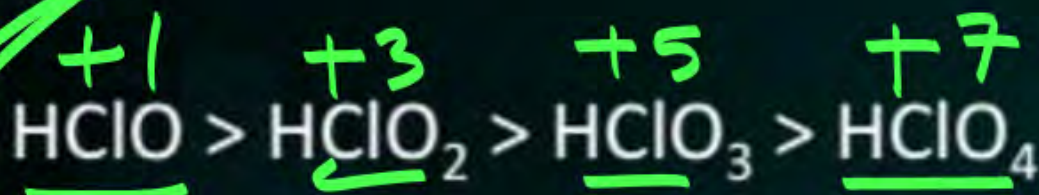
4





The correct order of relative acidity is :

1

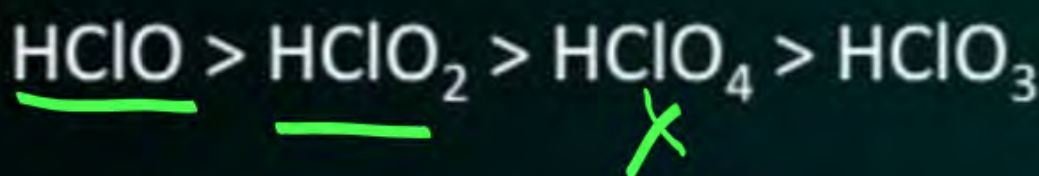


O.S ↑ E.N ↑ Acidity ↑

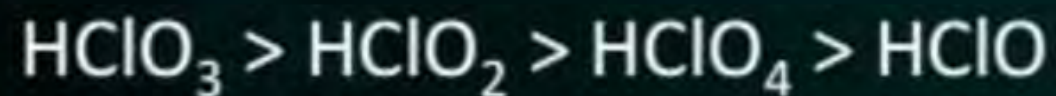
2



3



4



## Question



The element which forms oxides in all oxidation states

1

P

2

Sb

3



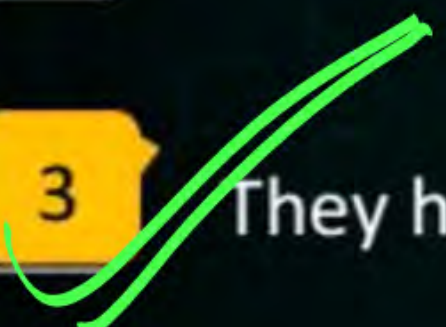
N

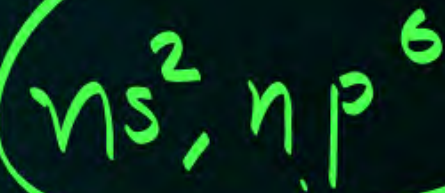
4

As



Inert gases do not react with other elements because :

- 1 They are monoatomic 
- 2 They have small size 
- 3  They have completely paired up and stable electron shells
- 4 They are found in abundance



## Question



Which is the best description of the behaviour of bromine in the reaction given below ?  $\text{H}_2\text{O} + \text{Br}_2 \rightarrow \text{HOBr} + \text{HBr}$

1

Reduced only

2

Oxidised only

3

Both oxidized and reduced

4

Proton acceptor only

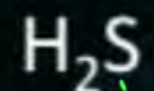


## Question

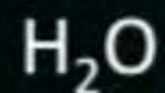


Which of the following has least bond angle ?

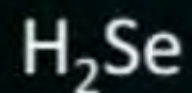
1



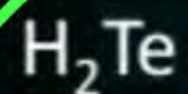
2



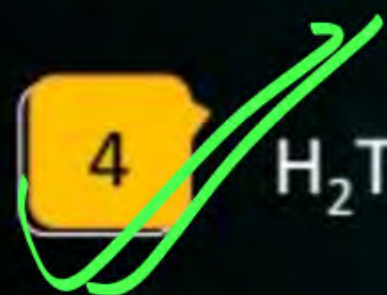
3



4



Size  
CA  $\uparrow$  B.A  $\downarrow$



**Halogens are coloured because :**

1

Their atoms have high electronegativity

2

Their molecules are hold together by weak van der waal's forces

3

Their molecules absorb visible light causing excitation of outer electrons to higher energy levels

HOMO — LUMO  
Transition

4

Their atoms absorb energy causing the excitation of outer electrons to higher energy levels



Which of the following is most basic oxide ?

1  $\text{Bi}_2\text{O}_3$

2  $\text{Sb}_2\text{O}_3$

3  $\text{As}_2\text{O}_3$

4  $\text{SeO}_2$  X

Which of the following gas mixture is used by divers inside the sea ?

1

$O_2 + He$

2

$O_2 + N_2$

3

$O_2 + Xe$

4

$O_2 + Ar$



In which of the following arrangements the given sequence is not strictly according to the property indicated against it ?

1  $\text{HF} < \text{HCl} < \text{HBr} < \text{HI}$  increasing acidic strength ✓

2  $\text{H}_2\text{O} < \text{H}_2\text{S} < \text{H}_2\text{Se} < \text{H}_2\text{Te}$  increasing  $\text{pK}_a$  values ✗

3  $\text{NH}_3 < \text{PH}_3 < \text{AsH}_3 < \text{SbH}_3$  increasing acidic strength ✓

4  $\text{CO}_2 < \text{SiO}_2 < \text{SnO}_2 < \text{PbO}_2$  increasing oxidising power ✓



The property which is not true about fluorine is :

1 Most of the reactions are exothermic ✓

2 It forms only one oxoacid ✓

3 Highest electronegativity ✓ 4.0

~~4 High F—F bond dissociation energy~~

Low due to l.p - l.p  
repulsion



Which of the following is incorrect statement ?

- 1  $\text{SiCl}_4$  is easily hydrolysed. ✓
- 2  $\text{GeX}_4$  ( $\text{X} = \text{F}, \text{Cl}, \text{Br}, \text{I}$ ) is more stable than  $\text{GeX}_2$ . ✓
- 3  $\text{SnF}_4$  is ionic in nature. ✓
- 4  $\text{PbF}_4$  is covalent in nature. ✗

Which of the following elements can be involved in  $p\pi-d\pi$  bonding ?

1

Carbon ✗

2

Nitrogen ✗

3

Phosphorus ✓

4

Boron ✗



Which of the following elements does not show allotropy?

1

Nitrogen

2

Bismuth

3

Antimony

4

Arsenic

(according to NCERT)

**Assertion :**  $\text{N}_2$  is less reactive than  $\text{P}_4$ . ✓

**Reason :** Nitrogen has more electron gain enthalpy than phosphorus. ✗

1

Both assertion and reason are correct statements, but reason is the correct explanation of the assertion.

2

Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.

3

Assertion is correct, but reason is wrong statement.

4

Assertion is wrong but reason is correct statements.



The incorrect statement regarding tetrahalides of group-16 is :

1  $\text{SF}_4$  is a gas and  $\text{SeF}_4$  is a liquid ✓

2 Hybridization of central atom is  $\text{sp}^3\text{d}$ . ✓

3  $\text{TeF}_4$  is a solid ✓

4 ~~Geometry of halides is "See-saw" and one lone pair present at the axial position of geometry.~~ ✗





The following are some statements related to VA group hydrides :

- (i) Reducing property increases from  $\text{NH}_3$  to  $\text{BiH}_3$ . ✓
- (ii) Tendency to donate lone pair decreases from  $\text{NH}_3$  to  $\text{BiH}_3$ . ✓
- (iii) Thermal stability of hydrides decreases from  $\text{NH}_3$  to  $\text{BiH}_3$ . ✓
- (iv) Bond angle of hydrides decreases from  $\text{NH}_3$  to  $\text{BiH}_3$ . ✓

The correct statements are

1

(i), (ii), (iii) and (iv)

2

(i), (iii) and (iv)

3

(i), (ii) and (iv)

4

(i) and (iv)



## Question



The p-Block element that forms predominantly basic oxide is :

1

N

2

P

3

As

4

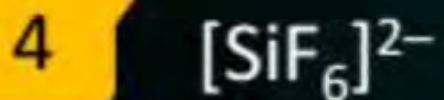
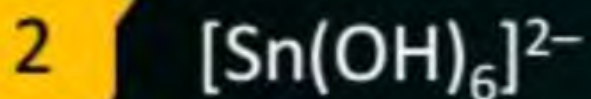
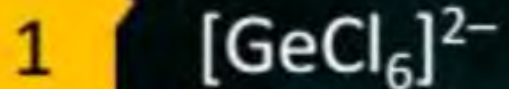
Bi

It is because of inability of  $ns^2$  electrons of the valence shell to participate in bonding that :

- 1  $\text{Sn}^{2+}$  is oxidizing while  $\text{Pb}^{4+}$  is reducing
- 2  $\text{Sn}^{2+}$  and  $\text{Pb}^{2+}$  are both oxidizing and reducing
- 3  $\text{Sn}^{4+}$  is reducing while  $\text{Pb}^{4+}$  is oxidizing
- 4  $\text{Sn}^{2+}$  is reducing while  $\text{Pb}^{4+}$  is oxidizing

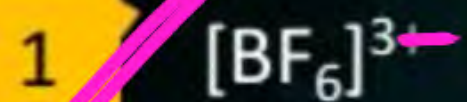


Which of the following species is not stable?

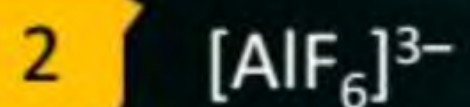


Which of the following species cannot exist?

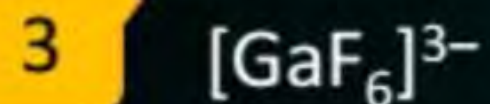
1



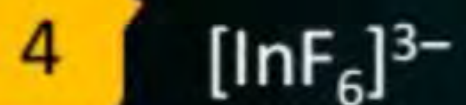
2



3



4





## Question



Melting point is highest for:

1

B

2

Al

3

Ga (min)

4

In

## Question



Which one of the following is most abundant in the earth's crust?

1

B

2

Al

3

Ga

4

In



The increasing order of atomic radii of the following group 13 elements is

1  $\text{Al} > \text{Ga} < \text{In} < \text{Tl}$

2  $\text{Ga} < \text{Al} < \text{In} < \text{Tl}$

3  $\text{Al} < \text{In} < \text{Ga} < \text{Tl}$

4  $\text{Al} < \text{Ga} < \text{Tl} < \text{In}$

Stability of +1 oxidation state increases or decreases

*Inert pair effect )*

1  $\text{Al} < \text{Ga} < \text{In} < \text{Tl}$

2  $\text{Tl} < \text{In} < \text{Ga} < \text{Al}$

3  $\text{In} < \text{Tl} < \text{Ga} < \text{Al}$

4  $\text{Ga} < \text{In} < \text{Al} < \text{Tl}$



Which of the following is the pair of maximum and minimum Lewis acid Character?

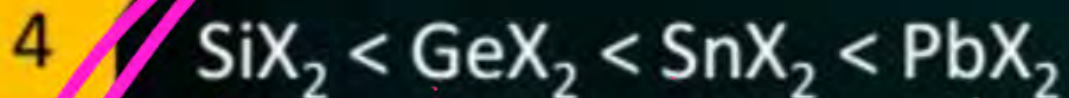
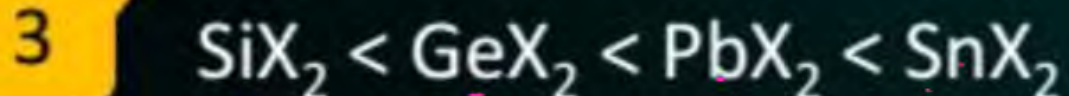
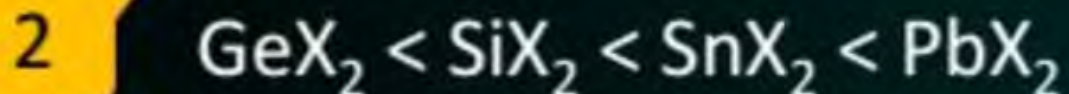
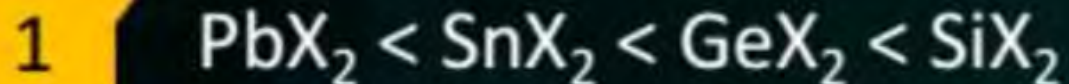
1  $\text{BF}_3$ ,  $\text{BI}_3$

2  $\text{BCl}_3$ ,  $\text{BF}_3$

3  $\text{BI}_3$ ,  $\text{BF}_3$

4  $\text{BBr}_3$ ,  $\text{BI}_3$

The stability of dihalides of Si, Ge, Sn and Pb increases steadily in the sequence



+2 ↑ se top to Bottom



## Question



In  $\text{SiF}_6^{2-}$  and  $\text{SiCl}_6^{2-}$ , which one is known and why?

1

$\text{SiF}_6^{2-}$  because of small size of F ✓

2

$\text{SiF}_6^{2-}$  because of large size of F ✗

3

$\text{SiF}_6^{2-}$  because of small size of Cl ✗

4

$\text{SiF}_6^{2-}$  because of large size of Cl ✗

## Question



**Different layers in graphite are held together by**

1

Ionic bonding

2

Metallic bonding

3

Covalent bonding

4

Vander Waals forces





**Thank** *You*