

Chapter 7

P-block Elements (Group 15, 16, 17 and 18)

(Assertion and Reason Questions)

Directions: These questions consist of two statements, each printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.

- (a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.
- (b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion
- (c) Assertion is correct, reason is incorrect
- (d) Assertion is incorrect, reason is correct.

Q.1. Assertion : Dinitrogen is inert at room temperature.

Reason : Dinitrogen directly combines with lithium to form ionic nitrides.

Q.2. Assertion : N_2 is less reactive than P_4 .

Reason : Nitrogen has more electron gain enthalpy than phosphorus.

Q.3. Assertion : When a metal is treated with conc. HNO_3 it generally yields a nitrate, NO_2 and H_2O .

Reason : Conc. HNO_3 reacts with metal and first produces a metal nitrate and nascent hydrogen. The nascent hydrogen then further reduces HNO_3 to NO_2

Q.4. Assertion : White phosphorus is more reactive than red phosphorus.

Reason : Red phosphorus consists of P_4 tetrahedral units linked to one another to form linear chains.

Q.5. Assertion : Bond angle of H_2S is smaller than H_2O .

Reason : Electronegativity of the central atom increases, bond angle decreases.

Q.6. Assertion : Both rhombic and monoclinic sulphur exist as S_8 but oxygen exists as O_2 .

Reason : Oxygen forms $p\pi - p\pi$ multiple bond due to small size and small bond length but $p\pi - p\pi$ bonding is not possible in sulphur.

Q.7. Assertion : SF_6 cannot be hydrolysed but SF_4 can be.

Reason : Six F atoms in SF_6 prevent the attack of H_2O on sulphur atom of SF_6 .

Q.8. Assertion: Ozone is thermodynamically stable with respect to oxygen.

Reason: Decomposition of ozone into oxygen results in the liberation of heat.

Q.9. Assertion : Inert gases are monoatomic,

Reason : Inert gases have stable configuration.

Q.10. Assertion : Fluorine exists only in -1 oxidation state.

Reason: Fluorine has $2s^2 2p^5$ configuration.

Q.11. Assertion : The fluorine has lower reactivity.

Reason : F-F bond has low bond dissociation energy.

Q.12. Assertion: F-F bond in F_2 molecule is weak.

Reason: F atom is small in size.

-X-X-X-

ANSWER KEY

Q.1 : (c)

Q.2 : (c)

Q.3 : (a)

Q.4 : (b) White phosphorus exists as P_4 tetrahedral molecule having P-P-P bond angle 60° . Hence the molecule is under strain and more reactive. On the other hand red phosphorus exists as P_4 tetrahedra which are joined together through covalent bonds giving polymeric structure.

Q.5 : (c)

Q.6 : (a)

Q.7 : (a)

Q.8 : (d)

Q.9 : (a)

Q.10 : (a)

Q.11 : (c)

Q.12 : (a)