

P BLOCK ELEMENTS !8TH GROUP

ANSWERS

1.	Why are the elements of Group 18 known as noble gases ? 18 th group elements have completely filled outermost orbitals ns ² np ⁶ ,obey octet rule .So chemically Inert and are called as noble gases.
2.	Why noble gases have positive values of electron gain enthalpy? They have completely filled outermost orbitals ns ² np ⁶ .They don't have tendency to accept electrons.
3.	Noble gases have very low boiling points. Why? They are monoatomic gases have only weak dispersion forces between them so they get liquefied at very low temperature.
4.	Why noble gases are inert? Noble gases except He have completely filled outermost orbitals ns ² np ⁶ . They have very high I.E and more positive EGE.
5.	What inspired N. Bartlett for carrying out reaction between Xe and PtF ₆ ? Neil Bartlett, prepared a red compound which is formulated as O ₂ ⁺ PtF ₆ ⁻ He, then realised that the first ionization enthalpy of molecular oxygen (1175 kJmol ⁻¹) was almost identical with that of xenon (1170 kJ mol ⁻¹). He made efforts to prepare same type of compound with Xe and was successful in preparing another red colour compound Xe.PtF ₆ -by mixing PtF ₆ and xenon.
6.	Does the hydrolysis of XeF ₆ lead to a redox reaction? No, the products of hydrolysis are XeOF ₄ and XeO ₂ F ₂ where the oxidation states of all the elements remain the same as it was in the reacting state.
7.	Write the hydrolysis reaction of XeF ₂ and XeF ₄ 2XeF ₂ (s) + 2H ₂ O(l) → 2Xe (g) + 4 HF(aq) + O ₂ (g) 6XeF ₄ + 12 H ₂ O → 4Xe + 2XeO ₃ + 24 HF + 3 O ₂
8.	How does Xenon fluorides react with fluoride ion acceptors and fluoride ion donors ? Xenon fluorides react with fluoride ion acceptors to form cationic species and fluoride ion donors to form fluoroanions. XeF ₂ + PF ₅ → [XeF] ₂ ⁺ [PF ₆] ₂ ⁻ ; XeF ₄ + SbF ₅ → [XeF ₃] ₂ ⁺ [SbF ₆] ₂ ⁻ XeF ₆ + MF → M ⁺ [XeF ₇] ⁻ (M = Na, K, Rb or Cs)
9.	Mention the uses of Helium Helium is a non-inflammable and light gas. Hence, it is used in filling balloons for meteorological observations. It is also used in gas-cooled nuclear reactors. Liquid helium (b.p. 4.2 K) finds use as cryogenic agent. It is used as a diluent for oxygen in modern diving apparatus because of its very low solubility in blood.
10.	Why is helium used in diving apparatus? because of its very low solubility in blood
11.	Why has it been difficult to study the chemistry of radon? It is radioactive and possess very short half life period.
12.	Mention the uses of Neon Neon is used in discharge tubes and fluorescent bulbs for advertisement display purposes. Neon bulbs are used in botanical gardens and in green houses
13.	Mention the uses of Argon Argon is used mainly to provide an inert atmosphere in high temperature metallurgical processes (arc welding of metals or alloys) and for filling electric bulbs
14.	How are xenon fluorides XeF ₂ , XeF ₄ and XeF ₆ obtained?

	$\text{Xe (g) + F}_2 \text{ (g)} \xrightarrow{(673\text{K,}/1\text{bar})} \text{XeF}_2\text{(s)}$ (xenon in excess) $\text{Xe (g) + 2F}_2 \text{ (g)} \xrightarrow{(873\text{K,}/ 7 \text{ bar})} \text{XeF}_4\text{(s)}$ (1:5 ratio) $\text{Xe (g) + 3F}_2 \text{ (g)} \xrightarrow{(573 \text{ K,}/60\text{--}70\text{bar})} \text{XeF}_6\text{(s)}$ (1:20 ratio)
15.	Give the formula and describe the structure of a noble gas species which is isostructural with: i) ICl_4^- (ii) IBr_2^- (iii) BrO_3^- Answer : i) XeF_4 ii) XeF_2 iii) XeO_3
16.	Which one of the following does not exist? (i) XeOF_4 (ii) NeF_2 (iii) XeF_2 (iv) XeF_6 Ans: NeF_2
17.	Why do noble gases have comparatively large atomic sizes? They are all monoatomic gases and possess weak vander waals forces of attraction between them. Since vander waals radii is greater than covalent radii, they have larger atomic radius.
18.	How XeO_3 and XeOF_4 are prepared? $\text{XeF}_6 + 3 \text{ H}_2\text{O} \rightarrow \text{XeO}_3 + 6 \text{ HF}$ $\text{XeF}_6 + \text{H}_2\text{O} \rightarrow \text{XeOF}_4 + 2 \text{ HF}$
19.	Why Xenon forms compounds with oxygen and fluorine only? Fluorine and oxygen are smaller in size and most electronegative elements.
20.	What happens when XeF_6 is partially hydrolysed? $\text{XeF}_6 + \text{H}_2\text{O} \rightarrow \text{XeOF}_4 + 2 \text{ HF}$ $\text{XeF}_6 + 2 \text{ H}_2\text{O} \rightarrow \text{XeO}_2\text{F}_2 + 4\text{HF}$
21.	Draw the structures of a. XeF_2 b. XeO_3 c. XeF_6 TXT BK