



CHEMISTRY

JEE (MAIN AND ADVANCED) CHEMISTRY

NOBLE GASES

Examples

1. The density of nitrogen obtained by the distillation of liquid air is more than that obtained by the decomposition of ammonium nitrate. Why?



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2. Two noble gases are obtained by the decay of radium. What are they?



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3. What is the mole fraction of argon in air?



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4. Why does helium not form He_2 , like Cl_2 molecule ?



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5. Radon has low ionisation potential and empty d-orbitals in the valence shell. Still it does not form compounds with other elements. Why?



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6. Why neon is totally inert?



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7. Why xenon and krypton are chemically reactive ?



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8. Cleveite mineral is a rich source of helium. Why?



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9. Liquid helium is called super fluid. Why?



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10. Helium is preferred to nitrogen, by the deep sea divers. Why?



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1. Mention the abundance of noble gases in air.



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2. Mention the abundance of noble gases in air.



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3. How is Radan prepared ?



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4. Comment on the accuracy of noble gases.



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5. Discuss the Ramsay's methods of isolation of noble gases.



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6. Describe the Fischer - Ringer's method.



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7. Describe the Dewar's method of separation of noble gases.



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8. How are gases separated into components from liquid air?



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Subjective Exercise 1 Long Answer Questions

1. How is Radon prepared ?



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2. Comment on the accuracy of noble gases.



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Subjective Exercise 1 Short Answer Questions

1. Discuss the Ramsay's methods of isolation of noble gases.



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2. Describe the Fischer - Ringe's method.



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3. Describe the Dewar's method of separation of noble gases.



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4. How are gases separated into components from liquid air?



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Subjective Exercise 2 Short Answer Questions

1. Discuss on the chemical reactivity of noble gases.



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2. Explain the structures of xenon difluoride, Xenon tetrafluoride and xenon hexafluoride molecules.



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3. Write important uses of helium.



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4. Discuss on the chemical reactivity of noble gases.



Watch Video Solution

5. Explain the structures of xenon difluoride, Xenon tetrafluoride and xenon hexafluoride molecules.



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6. Write important uses of helium.



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Subjective Exercise 2 Very Short Answer Questions

1. Why He is totally inert ?



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2. Radon is expected to be more reactive, but its compounds are not known. Why?



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3. Why He II is called superfluid ?



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4. Draw the structure of xenonmonoxy tetrafluoride.



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5. Draw the structures of trioxide of xenon.



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6. Why neon gas is commonly used in advertise ment lamps ?



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7. A mixture of helium and oxygen is used to assist asthma patients. Why?



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8. Write any two uses of argon.



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9. Why He is totally inert ?



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10. Radon is expected to be more reactive, but its compounds are not known. Why?



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11. Why He II is called superfluid ?



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12. Draw the structure of xenonmonoxy tetrafluoride.



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13. Draw the structures of trioxide of xenon.



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14. Why neon gas is commonly used in advertisement lamps ?



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15. A mixture of helium and oxygen is used to assist asthma patients. Why?



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16. Write any two uses of argon.



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Objective Exercise 1 General And Occurrence

1. The group that consists of only gaseous elements is

A. VIIA

B. VIA

C. Zero group

D. VIIA & Zero group

Answer: C



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Objective Exercise 1 General Characteristics

1. The most appropriate name for zero group elements

A. Noble gases

B. Aerogens

C. Inert gases

D. Rare gases

Answer: A



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2. The s-block element present in zero group is

A. Hydrogen

B. Helium

C. Neon

D. Radon

Answer: B



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3. The most common noble gas obtained in the radioactive decay is

A. He

B. Ar

C. Xe

D. Rn

Answer: A



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4. Isotope of which noble gas is isotonic (same number of neutrons) with Tritium?

A. Ne

B. He

C. Kr

D. Rn

Answer: B



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5. The noble gas that is discovered in the chromosphere of the Sun is

A. Rn

B. He

C. Xe

D. Ne

Answer: B



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6. $\frac{1}{125}$ th part of nitrogen gas isolated from atmosphere did not combine with any other substance due to

- A. The chemical inertness of N_2 gas
- B. The presence of Argon
- C. The presence of Argon & other noble gases
- D. The presence of O_2

Answer: C



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7. Sources of inert gases are

- A. Air
- B. Natural gas
- C. Minerals
- D. All the above

Answer: D



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8. Most and least abundant inert gases in atmosphere
terms of percentage by volume are respectively

A. Ar, He

B. Ar, Xe

C. Ar, Kr

D. Ar, Ne

Answer: B



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9. The rare gas which is more abundant in atmosphere is

A. He

B. Xe

C. Rn

D. Ar

Answer: D



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Objective Exercise 1 Physical And Chemical Properties

1. What is the correct order of occurrence (% by weight) in air of Ne, Ar and Kr?

A. $Ne > Ar > Kr$

B. $Ar > Ne > Kr$

C. $Ar > Kr > Ne$

D. $Ne > Kr > Ar$

Answer: B



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2. Noble gases with the highest ionisation energy and greater solubility in water are respectively

A. He and Ar

B. Xe and Rn

C. Xe and He

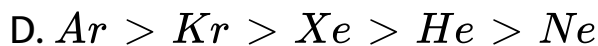
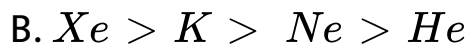
D. He and Xe

Answer: D



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3. The ease of liquification of noble gases M decreases in the order



Answer: C



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4. Noble gases have larger atomic size than the preceding halogens because

- A. They are gases
- B. They have low reactivity
- C. Vanderwaals radius is considered in them
- D. They are insoluble in water

Answer: C



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5. In solid state Ar atoms are held together by

- A. Ionic bonds
- B. Covalent bonds
- C. Hydrogen bonds
- D. Vanderwaal forces

Answer: D



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6. Liquid Helium at 2.2K and at 1atm pressure flows in the upward direction. It is because of its low

- A. boiling point
- B. heat of vaporisation
- C. viscosity
- D. surface tension

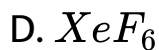
Answer: C



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7. The first compound of a noble gas known is

- A. $Xe.6H_2O$
- B. $Xe[PtF_6]$



Answer: B



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8. Which of the following elements can not form compounds?

A. Helium

B. Xenon

C. Fluorine

D. Hydrogen

Answer: A



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9. The most reactive noble gas element is

A. He

B. Ne

C. Kr

D. Xe

Answer: D



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10. The reactivity of xenon is attributed to

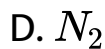
- A. small atomic size of xenon
- B. highest heat of vapourisation
- C. lower ionisation potential
- D. higher ratio of molar heat capacities

Answer: C



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11. Which of the following does not react with xenon to form compounds



Answer: D



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12. Which of the following can form compounds with xenon



C. Br_2

D. Al

Answer: B



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13. What is the atomic number of noble gas that reacts with F_2

A. 10

B. 12

C. 18

D. 54

Answer: D



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14. What is the atomic number of noble gas that reacts with F_2

A. 10

B. 2

C. 18

D. 54

Answer: D



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15. The ease of liquification of noble gases M decreases in the order

A. He gt Ne gt Al gt Krgt Xe

B. Xe gt Kr gt Ne gt He

C. Xe gt Kr gt Ar gt Ne gt He

D. Ar gt Kr gt Xe gt He gt Ne

Answer: C



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16. Noble gases with the highest ionisation energy and greater solubility in water are respectively

A. He and Ar

B. Xe and Rn

C. Xe and He

D. He and Xe

Answer: D



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17. Noble gases have larger atomic size than the preceding halogens because

- A. They are gases
- B. They have low reactivity
- C. Vanderwaals radius is considered in them
- D. They are insoluble in water

Answer: C



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18. In solid state Ar atoms are held together by

- A. Ionic bonds
- B. Covalent bonds
- C. Hydrogen bonds
- D. Vanderwaal forces

Answer: D



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19. The first compound of a noble gas known is

- A. $Xe.6H_2O$
- B. $Xe[PtF_6]$



Answer: B



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20. Which of the following elements can not form compounds?

A. Helium

B. Xenon

C. Fluorine

D. Hydrogen

Answer: A



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21. The most reactive noble gas element is

A. He

B. Ne

C. Kr

D. Xe

Answer: D



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22. The reactivity of xenon is attributed to

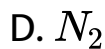
- A. small atomic size of xenon
- B. highest heat of vapourisation
- C. lower ionisation potential
- D. higher ratio of molar heat capacities

Answer: C



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23. Which of the following does not react with xenon to form compounds



Answer: D



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24. Which of the following can form compounds with xenon



C. Br_2

D. Al

Answer: B



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Objective Exercise 1 Compounds Of Xenon

1. The shape of XeF_6 is

A. Pentagonal bipyramidal

B. Square planar

C. Octahedral

D. Distorted octahedral

Answer: D



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2. The bond angle in XeF_4 molecule is

A. 180°

B. 120°

C. 100°

D. 90°

Answer: D

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3. Bond angle is the highest in the molecule



Answer: D

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4. Number of bond pairs and lone pairs respectively that the central atom in xenon difluoride has

A. 2,6

B. 2, 3

C. 2,4

D. 2, 2

Answer: B



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5. The compound that is explosive in dry state



Answer: A



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6. The number of lone pairs and bond pairs present on Xe of XeO_3 , molecule

A. 1,3

B. 1,6

C. 4,3

D. 6,1

Answer: B



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7. The number of lone pairs of electrons present on Xe in XeF_4 is

A. 3

B. 4

C. 2

D. 1

Answer: C



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8. The oxidation state of Xe in XeO_3 , and bond angle in it are

A. +6, 109°

B. +8, 103°

C. +6, 103°

D. +8, 120°

Answer: C



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9. Which of the following is not correct?

A. XeO_3 has four σ and four π bonds

B. The hybridisation of Xe in XeF_4 is sp^3d^2

C. Among noble gases, the occurrence (percent by weight) of argon is highest in air

D. Liquid helium is used as cryogenic liquid

Answer: A



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10. Which of the following has pyramidal shape?



Answer: B



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11. The compound of Xenon with the lowest bond angle



Answer: D



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12. Which of the following statements is not true ?

A. Helium was the first ever inert gas to be discovered

B. Argon is used in electric bulbs

C. Xenon is radioactive in nature

D. Radon is obtained during radioactive disintegration

Answer: C



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13. The shape of XeF_6 is

A. Pentagonal bipyramidal

B. Square planar

C. Octahedral

D. Distorted octahedral

Answer: D



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14. The bond angle in XeF_4 molecule is

A. 180°

B. 120°

C. 100°

D. 90°

Answer: D



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15. Bond angle is the highest in the molecule



Answer: D



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16. Number of bond pairs and lone pairs respectively that the central atom in xenon difluoride has

A. 2,6

B. 2,3

C. 2,4

D. 2,2

Answer: B



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17. The compound that is explosive in dry state



Answer: A



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18. The number of lone pairs and bond pairs present on Xe of XeO_3 , molecule

A. 1,3

B. 1,6

C. 4,3

D. 6,1

Answer: B



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19. The total number of lone pair present in XeF_4 is

A. 3

B. 4

C. 2

D. 1

Answer: C



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20. The oxidation state of Xe in XeO_3 and the bond angle in it respectively, are

A. +6, 109°

B. +8, 103°

C. +6, 103°

D. +8, 120°

Answer: C



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21. Which of the following is not correct?

A. XeO_3 has four σ and four π bonds

B. The hybridisation of Xe in XeF_4 is sp^3d^2

C. Among noble gases, the occurrence (percent by weight) of argon is highest in air

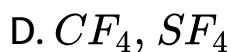
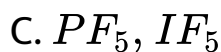
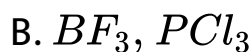
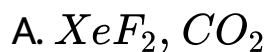
D. Liquid helium is used as cryogenic liquid

Answer: A



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22. The pair of species having identical shaped for molecules of both species is

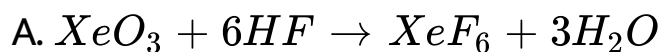


Answer: A

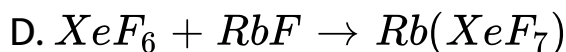
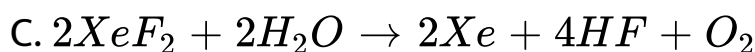
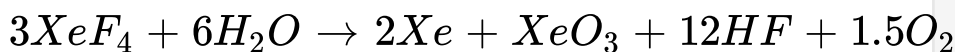


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23. Which one of the following reactions of Xenon compounds is not feasible?



B.



Answer: A



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24. In XeF_2 , XeF_4 , XeF_6 the number of lone pairs of Xe are respectively

A. 2, 3, 1

B. 1, 2, 3

C. 4, 1, 2

D. 3, 2, 1

Answer: D



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25. In XeF_4 molecule, the two lone pairs of electrons on Xe atom occupy which of the following positions on the square planar structure?

- A. Two adjacent corners on the planar square
- B. Two diagonally opposite corners on the planar square
- C. One corner of the planar square and one trans position
- D. Two trans positions

Answer: D



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26. Match the following

Set – I



Set - II

a) Distorted octahedral

b) Square planar

c) Pyramidal

1) I – b, II – a, III – c 2) I – b, II – c, III – a

3) I – c, II – b, III – a 4) I – a, II – b, III – c



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27. Which of the following has pyramidal shape?





Answer: B



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28. The compound of Xenon with the lowest bond angle



Answer: D



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29. The reaction, $\text{Xe}(\text{excess}) + \text{F}_2 \rightarrow \text{XeF}_2$ is conducted at

A. 573 K, 16-70 bar

B. 273 K, 10 bar

C. 673 K, 1 bar

D. 873 K, 7 bar

Answer: C



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30. The maximum valency (8) is shown by

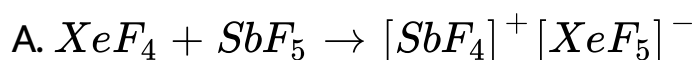
- A. Xe and Os only
- B. Xe and Ru only
- C. Xe, Os and Ru
- D. Xe, Os, Ru and Mn

Answer: C

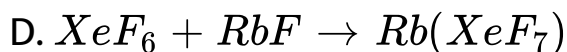
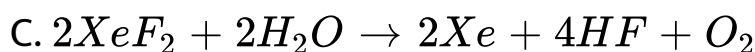
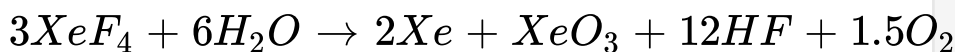


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31. Which one of the following reactions of Xenon compounds is not feasible?



B.



Answer: A



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Objective Exercise 1 Uses Of Noble Gases

1. The gas that is most convenient to use in gas thermometers

A. He

B. Xe

C. N_2

D. CO_2

Answer: A



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2. Components of gaseous mixture useful for sea divers

A. O_2 and He

B. O_2 and H_2

C. O_2 and N_2

D. O_2 and CO_2

Answer: A



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3. Helium mixed with oxygen is used in the treatment of

- A. Beri beri
- B. Burning feet
- C. Joints burning
- D. Asthma

Answer: D



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4. Helium mixed with oxygen is used in the treatment of

- A. Helium is much less soluble in blood
- B. Helium does not react with oxygen
- C. Helium is the lightest gas
- D. Helium has the highest ionisation potential

Answer: A



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5. The reaction, $\text{Xe}(\text{excess}) + \text{F}_2 \rightarrow \text{XeF}_2$ is conducted at

A. 573 K, 16-70 bar

B. 273 K, 10 bar

C. 673 K, 1 bar

D. 873 K, 7 bar

Answer: C



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6. Helium is used in gas balloons instead of hydrogen, because

- A. it is monoatomic
- B. it is lighter
- C. it is not radioactive
- D. it is non - combustible

Answer: D



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7. Helium is used in gas balloons instead of hydrogen, because

- A. it is monoatomic
- B. it is lighter
- C. it is not radioactive
- D. it is non- combustible

Answer: D



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8. Helium is mixed with oxygen for the respiration by deep sea divers, because

- A. Helium is much less soluble in blood
- B. Helium does not react with oxygen
- C. Helium is the lightest gas
- D. Helium has the highest ionisation potential

Answer: A



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9. Helium - oxygen mixture is used by deep sea divers in preference to nitrogen - oxygen mixture because

A. Helium is much less soluble in blood than nitrogen

B. Nitrogen is much less soluble in blood than helium

C. Due to high pressure deep under the sea nitrogen and oxygen react to give poisonous nitric oxide

D. Nitrogen is highly soluble in water

Answer: A



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10. Components of gaseous mixture useful for sea divers

A. O_2 and He

B. O_2 and H_2

C. O_2 and N_2

D. O_2 and CO_2

Answer: A



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11. The gas that is most convenient to use in gas thermometers

A. He

B. Xe

C. N_2

D. CO_2

Answer: A



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Objective Exercise 1 Assertion And Reason Type

1. (A): Noble gases are sparingly soluble in water

(R): Neon has high positive electron gain enthalpy.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: B



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2. (A): Noble gases are lower melting points and boiling points

(R): Noble gases possess weak dispersion forces.

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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3. (A): Among noble gases Xe can readily form compounds with fluorine

(R): Among noble gases, Xe has lesser ionisation potential

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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4. (A): The name helium is made after sun

(R): Helium is abundant gas in sun's chromosphere

A. Both A & R are true, R is the correct explanation
of A

B. Both A & R are true, R is not correct explanation
of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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5. (A): Helium is found in radioactive minerals

(R): During α -day, helium is formed and is occluded in radioactive minerals

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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6. (A): All noble gases are monoatomic

(R): Noble gas atom is stable and does not dimerise or polymerise

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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7. (A): Neon is used to fill advertisement glass bulbs

(R): Neon gives coloured discharge at low pressure

A. Both A & R are true, R is the correct explanation
of A

B. Both A & R are true, R is not correct explanation
of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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8. (A): The mole fraction of argon in air is 0.95

(R): The volume percentage of all noble gases in air is equal to unity

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: D



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9. (A): Radium is a natural source of two noble gases

(R): Radium undergoes α -emission spontaneously

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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10. (A): Electron gain enthalpy of noble gases is very less **(R):** Atoms of noble gases have completely filled orbitals

A. Both A & R are true, R is the correct explanation of A

B. Both A & R are true, R is not correct explanation of A

C. A is true, R is false

D. A is false, R is true

Answer: A



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Objective Exercise 2 General And Occurrence

1. The chemistry of zero group elements is little known because

- A. They are less abundant
- B. They have low ionisation potential
- C. They have octet configuration
- D. They have low boiling points

Answer: C



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2. Noble gas that is not present in air

A. He

B. Ar

C. Kr

D. Rn

Answer: D



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Objective Exercise 2 Properties

1. Most inert among the following

A. He

B. Ne

C. Ar

D. Kr

Answer: A



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2. The noble gas which behaves abnormally in liquid state is

A. Xe

B. Ne

C. He

D. Ar

Answer: C



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3. The forces that make the molecules of a noble gas in liquid state

A. Dipolar forces

B. Dipole - induced dipole forces

C. Vander waal's force

D. Repulsive forces

Answer: C



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4. The element having highest ionisation potential is

A. H

B. N

C. O

D. He

Answer: D



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5. The correct order of enthalpy of vaporsation of noble gases is

A. $Xe > Kr > Ar > Ne > He$

B. $Xe > Ar > He > Ne > KI$

C. $He > Ne > Kr > Ar > Xe$

D. $Ne > Xe > K > He > AI$

Answer: A



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6. The ease of liquefaction of noble gases decreases in the order



Answer: B



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Objective Exercise 2 Compounds And Uses

1. The compound which will not exist is



Answer: D



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2. Which of the following has square pyramidal structure



Answer: D



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3. In XeF_6 molecule, Xenon atom undergoes

A. sp^3d^2 hybridisation in its 2nd excited state

B. sp^3d^3 hybridisation in its 2nd excited state

C. sp^3d^3 hybridisation in its 3rd excited state

D. sp^3d^3 hybridisation in its 4th excited state

Answer: C



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4. The molecule in which there is no lone pair on xenon atom is

A. XeF_6

B. XeF_2

C. XeF_4

D. Ne

Answer: C



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5. Hydrolysis of XeF_2 gives

A. Xe and O_2 only

B. Xe , HF and O_2

C. O_2 only

D. XeF_6 and O_2 only

Answer: B



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6. The gas used in gas thermometer is

A. He

B. O_2

C. Xe

D. Ne

Answer: A



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7. Maximum temperature provided by liquid helium is

A. 0 K

B. 2.2 K

C. 4.2 K

D. 11.2 K

Answer: C



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8. Arc welding of metals can be done normally using

A. Ne

B. Ar

C. Kr

D. Xe

Answer: B



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9. The compound which will not exist is



Answer: D

10. Which of the following has square pyramidal structure?



Answer: D

11. In XeF_6 molecule, Xenon atom undergoes

A. sp^3d^2 hybridisation in its 2nd excited state

B. sp^3d^3 hybridisation in its 2nd excited state

C. sp^3d^3 hybridisation in its 3rd excited state

D. sp^3d^3 hybridisation in its 4th excited state

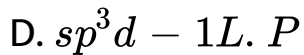
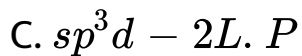
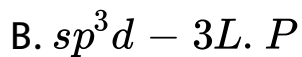
Answer: C



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12. Regarding XeF_2 the correct combination is

A. $sp^3d - 4L. P$



Answer: B



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13. The noble gas compound iso-structural with bromate ion is:



D. XeOF_2

Answer: A



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14. Among the following molecules,

a)XeO₃, b)XeOF₄ and c)XeF₆,

Those having same number of lone pairs on Xe are

A. a and b

B. b and c

C. a, b and c

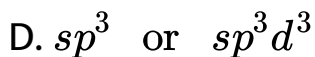
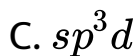
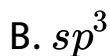
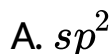
D. a and c

Answer: C



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15. In the compound formation xenon atom is in the third excited state, the expected hybridisation of xenon is

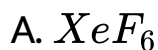


Answer: D



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16. The molecule in which there is no lone pair on xenon atom is



Answer: C



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17. Which of the following has a planar structure?



Answer: D



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18. XeF_6 on partial hydrolysis gives



B. XeO_2F_2 only

C. both XeOF_4 and XeO_2F_2

D. XeOF_4 or XeO_2F_2

Answer: D



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19. Number of σ and π bonds present in XeO_4 molecule are

A. 5σ and 1π

B. 4σ and 2π

C. 2σ and 4π

D. 3σ and 3π

Answer: A



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20. Number of lone pair and bond pairs present on Xe of $XeOF_4$ molecule is

A. 1,2

B. 1,4

C. 1,6

D. 2,4

Answer: C



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21. Hydrolysis of XeF_2 gives

- A. Xe and O_2 only
- B. Xe, HF and O_2
- C. O_2 only
- D. XeF_6 and O_2 only

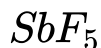
Answer: B



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22. Xenon tetrafluoride, XeF_4 is :

A. tetrahedral and acts as a fluoride donor with



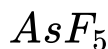
B. square planar and acts as a fluoride donor with



C. square planar and acts as fluoride donor with



D. see-saw shape and acts as a fluoride donor with



Answer: B



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23. The compound that cannot be formed by xenon is



Answer: C



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24. When xenon hexafluoride is completely hydrolysed a xenon compound 'A' is formed. The number of σ -bond, π -bonds and lone pairs present on Xe in 'A' respectively are

A. 4, 4, 0

B. 3, 3, 1

C. 4, 1, 1

D. 4, 2, 0

Answer: B



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25. In reaction (1), XeF_6 hydrolysis to form HF and X. In reaction (2), XeF_6 on partial hydrolysis form HF, Y and Z.

The product X,Y,Z respectively, are

- A. XeO_3 , Xe , XeO_2F_2
- B. XeO_3 , $XeOF_4$, XeO_2F_2
- C. Xe , XeO_4 , XeO_2F_2
- D. XeO_3 , O_2 , XeO_2F_2

Answer: B



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Practice Exercise

1. The gaseous mixture present in the 'Sun' atmosphere

A. Ar, Kr, Xe

B. Ne, Kr

C. Kr, Xe

D. He, H_2

Answer: D



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2. D_3 line was observed along with D, and D in the solar spectrum. This denotes the presence of

- A. helium in chromosphere of sun
- B. neon in chromosphere of sun
- C. argon in chromosphere of sun
- D. xenon in chromosphere of sun

Answer: A



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3. The following are some statements regarding Claude's method

I : The boiling point of Ar is nearer to O_2

II : N_2 is removed as $CaCN_2$

III : O_2 is removed as MgO

IV : From a mixture of He and Ne, Ne is removed by liquifaction with liquid hydrogen

The correct statements are

A. Both I and II

B. Both I and III

C. Both I and IV

D. I, II and IV

Answer: D



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4. Mixture of inert gases can be separated by

- A. Electrolysis of their compounds
- B. Fractional distillation of air
- C. Adsorption and desorption by coconut charcoal
- D. Sublimation

Answer: C



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5. The first ionization energy of neon is 2080.7 KJ/mole.

The first of ionisation energy of helium may be

A. 2080.7 KJ/mole

B. 2372.3 KJ/mole

C. 1520.5 KJ/mole

D. 1800.4 KJ/mole

Answer: C



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6. Only one lone pair is present on the central atom of



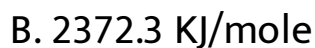
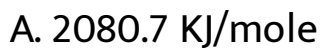
Answer: B



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7. The first ionization energy of neon is 2080.7 KJ/mole.

The first of ionisatioin energy of helium may be



C. 1520.5 KJ/mole

D. 1800.4 KJ/mole

Answer: B



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8. The compound in which the number of dit - pi bonds are equal to those present in C104

A. XeF_4

B. XeO_3

C. XeO_4

D. XeF_6

Answer: B



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9. The following are some statements regarding Claude's method

I : The boiling point of Ar is nearer to O_2

II : N_2 is removed as $CaCN_2$

III : O_2 is removed as MgO

IV : From a mixture of He and Ne, Ne is removed by liquifaction with liquid hydrogen

The correct statements are

A. Both I and II

B. Both I and III

C. Both I and IV

D. I, II and IV

Answer: D



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10. Which of the following compound is both hygroscopic and explosive

A. XeF_2

B. XeO_4

C. XeO_3

D. XeF_6

Answer: C



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11. Which of the following noble gas element can readily form compounds with fluorine

A. Xe

B. Ar

C. Kr

D. Ne

Answer: A



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12. The gas used in beacon lamps is

A. *Ne*

B. *He*

C. *Ar*

D. *Kr*

Answer: A



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13. The bond angle in XeO_3 molecule decreases from $109^\circ 28'$ to 103° due to

- A. greater repulsions among lone pairs
- B. greater repulsions among lone pair and bond pair
- C. greater repulsions among bond pairs
- D. steric effect

Answer: B



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14. The Noble gas used in atomic reactors is

A. Krypton

B. Oxygen

C. Neon

D. Helium

Answer: D



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15. When 1 lit of air is burnt with a mixture calcium carbide and anhydrous calcium chloride, the reduction

in volume of air is about

A. 10ml

B. 990ml

C. 100ml

D. 900ml

Answer: B



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16. Which of the following in liquid state can provide lowest temperature

A. nitrogen

B. Helium

C. oxygen

D. argon

Answer: B



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17. Gas that is used in preparing flash bulbs is

A. Oxygen

B. helium

C. Xenon

D. radon

Answer: C



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18. The number of lone pairs present on the central atom of XeF_2 , XeF_4 , and XeF_6 , respectively

A. 1, 2, 3

B. 3, 2, 1

C. 2, 2, 1.

D. 1, 3, 2

Answer: B



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Problems

1. The density of nitrogen obtained by the distillation of liquid air is more than that obtained by the decomposition of ammonium nitrate. Why?



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2. Two noble gases are obtained by the decay of radium. What are they?



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3. Why do noble gases have comparatively large atomic sizes ?



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4. Why does helium not form He_2 like Cl_2 molecule?



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5. Why has it been difficult to study the chemistry of radon?



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6. Why neon is totally inert?



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7. Why xenon and krypton are chemically reactive?



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8. Helium is preferred to nitrogen, by the deep sea divers. Why?



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9. Liquid helium is called super fluid. Why?



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10. Two noble gases are obtained by the decay of radium. What are they?



Watch Video Solution

11. The density of nitrogen obtained by the distillation of liquid air is more than that obtained by the decomposition of ammonium nitrate. Why?



Watch Video Solution

12. What is the mole fraction of argon in air?



Watch Video Solution

13. Why does helium not form He_2 like Cl_2 molecule?



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14. Radon has low ionisation potential and empty d-orbitals in the valence shell. Still it does not form compounds with other elements. Why?



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15. Why neon is totally inert?



Watch Video Solution

16. Why xenon and krypton are chemically reactive?



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17. Cleveite mineral is a rich source of helium. Why?



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18. Liquid helium is called super fluid. Why?



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19. Helium is preferred to nitrogen, by the deep sea divers. Why?



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Exercise 4 1 1

1. Mention the abundance of noble gases in air.



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2. Comment on the occurrence of noble gases.



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3. Why are the elements of zero group inert?



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Exercise 4 1 2

1. Discuss on the chemical reactivity of noble gases.



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2. How are xenon difluoride, xenon tetrafluoride and xenon hexafluoride prepared? Write the structures of these molecules.



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3. How are XeO_3 and $XeOF_4$ prepared ?





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4. Write important uses of helium.



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5. Radon is expected to be more reactive, but its compounds are not known. Why?



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6. A mixture of helium and oxygen is used to assist asthma patients. Why?





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7. Why neon gas is commonly used in advertisement lamps ?



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Exercise 4 2

1. Helium behaves unique during cooling. Explain.



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2. Helium is chemically most inert. Justify.



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3. Discuss on the shape of $XeOF_4$ molecule.



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4. Helium is filled in gas thermometers. Why?



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5. Discharge lamps containing neon gas is used in advertisement purpose. What is the reason?



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Objective Exercise 1 Introduction Occurrence

1. The group that consists of only gaseous elements is

A. VIIA

B. VIA

C. Zero group

D. VIIA & Zero group

Answer: C



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2. The most appropriate name for zero group elements

A. Noble gases

B. Aerogens

C. Inert gases

D. Rare gases

Answer: A



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3. The s-block element present in zero group is

A. Hydrogen

B. Helium

C. Neon

D. Radon

Answer: B



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4. The most common noble gas obtained in the radioactive decay is

A. He

B. Ar

C. Xe

D. Rn

Answer: A



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5. Isotope of which noble gas is isotonic (same number of neutrons) with Tritium?

A. Ne

B. He

C. Kr

D. Rn

Answer: B



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6. The noble gas that is discovered in the chromosphere of the Sun is

A. Rn

B. He

C. Xe

D. Ne

Answer: B



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7. Sources of inert gases are

- A. Air
- B. Natural gas
- C. Minerals
- D. All the above

Answer: D



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8. Most and least abundant inert gases in atmosphere
in terms of percentage by volume are respectively

- A. Ar, He
- B. Ar, Xe

C. Ar, Kr

D. Ar, Ne

Answer: B



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9. The rare gas that is most abundant in the atmosphere is

A. He

B. Xe

C. Rn

D. Ar

Answer: D



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10. What is the correct order of occurrence in air of Ne, Ar and Kr?

A. Ne < Ar < Kr

B. Ar < Ne < Kr

C. Ar < Kr < Ne

D. Ne < Kr < Ar

Answer: B



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11. The ratio C_p / C_v for noble gases is

A. 1.67

B. 1.33

C. 1.42

D. 1.84

Answer: A



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12. The element $Z=117$ has not been discovered. In which group would you place these element and also give the electronic configuration.

A. 16th group, 7th period

B. 17th group, 6th period

C. 18th group, 7th period

D. 18th group, 6th period

Answer: C



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13. If ionization enthalpy for hydrogen atom is 13.6 eV, then ionization enthalpy for He^+ will be

A. 54.4eV

B. 6.8eV

C. 13.6eV

D. 24.5eV

Answer: A



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14. The heats of vaporization of noble gases vary in the order

A. $\text{He} > \text{Ne} > \text{Ar} > \text{Kr} > \text{Xe} > \text{Rn}$

B. $\text{He} < \text{Ne} < \text{Ar} < \text{Kr} < \text{Xe} < \text{Rn}$

C. $\text{Xe} < \text{K} < \text{Ne} < \text{He} < \text{Rn} < \text{Al}$

D. $\text{He} < \text{Ne} = \text{Ar} > \text{Kr} < \text{Xe} < \text{Rn}$

Answer: B



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Objective Exercise 2 General And Occurrence

1. The chemistry of zero group elements is little known because

- A. They are less abundant
- B. They have low ionisation potential
- C. They have octet configuration
- D. They have low boiling points

Answer: C



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2. Noble gas that is not present in air

A. He

B. Ar

C. Kr

D. Rn

Answer: D



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3. When a Radioactive substance is kept in a vessel, the atmosphere around it is rich with

A. He

B. Ne

C. Ar

D. Xe

Answer: A



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4. Which of the following is most volatile

A. He

B. Xe

C. Kr

D. Ne

Answer: A



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5. Which element disintegrates to give two noble guses

A. Ra

B. Th

C. Rn

D. He

Answer: A



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6. $XeF_6 + MF \rightarrow M^+ [XeF_7]^-$. Here "M" is

- A. Alkali metals
- B. Alkaline earth metals
- C. Transition metals
- D. Inner transition metals

Answer: A



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Objective Exercise 2 Properties

1. Most inert among the following

A. He

B. Ne

C. Ar

D. Kr

Answer: A



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2. The fact helped the preparation of first compound of Xenon

- A. High bond energy of Xe - F
- B. Low bond energy of F - F in F_2
- C. Ionisation energies of O_2 and xenon were almost similar
- D. None of these

Answer: C



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3. The noble gas which behaves abnormally in liquid state is

- A. Xe

B. Ne

C. He

D. Ar

Answer: C



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4. The forces that make the molecules of a noble gas in liquid state

A. Dipolar forces

B. Dipole - induced dipole forces

C. Vander waal's force

D. Repulsive forces

Answer: C



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5. Noble gases are only sparingly soluble in water due to :

- A. dipole - dipole interactions
- B. induced dipole-induced dipole interactions
- C. dipole-induced dipole interactions
- D. hydrogen bonding

Answer: C



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6. Noble gases exist only in monoatomic state. This is due to

- A. Non availability of unpaired electrons
- B. high ionization energy
- C. large size
- D. zero electron affinity

Answer: A



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7. The oxidation state of the noble gas element in xenon oxydifluoride $[XeOF_2]$ is

A. 0

B. +1

C. +4

D. +8

Answer: C



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8. Most inert among the following

A. He

B. Ne

C. Ar

D. Kr

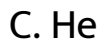
Answer: A



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9. Which of the following is diamagnetic in nature?

A. O_2



Answer: C



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10. Bond length order in various xenon fluorides is



D. cannot be predicted

Answer: C



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11. The incorrect statement regarding to Noble gases is

A. Their electronegative values are zero

B. They are held together by Vanderwaals forces

C. They occupy the peaks in the graphs of
ionisation potential and atomic number

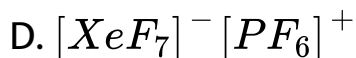
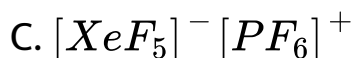
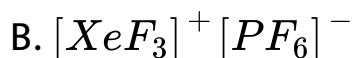
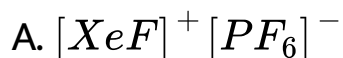
D. Their boiling points decrease from He to Xe

Answer: D



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12. Xenon difluoride reacts PF_5 they give which pair of ions



Answer: A



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13. Identify the correct set

Molecule	Hybridisation	Shape	Number of lone pairs of electrons
1) XeO_4	sp^3d^2	pyramidal	1
2) XeO_3	sp^3	pyramidal	1
3) XeF_4	sp^3d^2	planar	3
4) XeF_2	sp^3d	linear	2



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14. Among the following inert gas elements, the elements that shows highest chemical reactivity is

A. Ne

B. Ar

C. He

D. Xe

Answer: D



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15. Which group P-block elements show highest positive oxidation state ?

A. 16

B. 17

C. 18

D. 15

Answer: C



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16. The xenon compound which has more number of lone pairs in its central atom is



Answer: C



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Objective Exercise 2 Uses Of Noble Gases

1. Colour display in green houses can be made with discharge tubes. The gas that is very frequently used for the display is

A. chromyl chloride

B. Neon

C. Nitrous oxide

D. Krypton

Answer: B



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2. Cryogenic studies are those studies performed at very low temperatures. The best supporting substance is

A. Liquid argon

B. Liquid nitrogen

C. Liquid helium

D. Liquid paraffin

Answer: C



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Objective Exercise 3 Previous Neet Aipmt Questions

1. Which is a planar molecule?



Answer: B



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2. The solubility of noble gases in water shows the order :

A. He gt Ar gt Kr gt Ne gt Xe

B. He gt Ne gt Ar gt Kr gt Xe

C. Xe gt Kr gt Ar gt Ne gt He

D. none of the above

Answer: C



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3. Among the following molecules,

a) XeO_3 , b) $XeOF_4$ and c) XeF_6 ,

Those having same number of lone pairs on Xe are

A. (i) and (ii) only

B. (i) and (iii) only

C. (ii) and (iii) only

D. (i), (ii) and (iii)

Answer: D



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4. The correct geometry and hybridisation for XeF_4 are

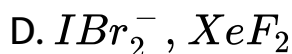
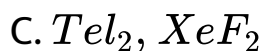
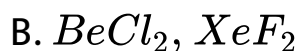
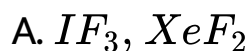
- A. Octahedral, sp^3d^2
- B. Trigonal bipyramidal, sp^3d
- C. Planar triangle, sp^3d^3
- D. Square planar, sp^3d^2

Answer: D



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5. Which of the following pairs of compounds is isolectronic and isostructural?



Answer: D



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Objective Exercise 4 Assertion A And Reason R Type Questions

1. (A): Noble gases are sparingly soluble in water

(R): Neon has high positive electron gain enthalpy.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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2. (A): Noble gases are lower melting points and boiling points

(R): Noble gases possess weak dispersion forces.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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3. (A): Among noble gases Xe can readily form compounds with fluorine

(R): Among noble gases, Xe has lesser ionisation potential

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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4. (A): The name helium is made after sun

(R): Helium is abundant gas in sun's chromosphere

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



Watch Video Solution

5. (A): Helium is found in radioactive minerals

(R): During α -day, helium is formed and is occluded in radioactive minerals

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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6. (A): All noble gases are monoatomic

(R): Noble gas atom is stable and does not dimerise or polymerise

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



Watch Video Solution

7. (A): Neon is used to fill advertisement glass bulbs

(R): Neon gives coloured discharge at low pressure

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



Watch Video Solution

8. (A): The mole fraction of argon in air is 0.95

(R): The volume percentage of all noble gases in air is equal to unity

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D



Watch Video Solution

9. (A): Radium is a natural source of two noble gases

(R): Radium undergoes α -emission spontaneously

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



Watch Video Solution

10. (A) Below 2.2 Kelvin, helium is called super fluid

(R) Helium has abnormally low viscosity below 2.2 Kelvin

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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11. (A) Xenon fluorides are well known and stable but the corresponding chlorides have not been reported.

(R) Xe-F bond is more strong than Xe-Cl bond and F_2 molecule has low bond dissociation energy than that of Cl_2 molecule.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



Watch Video Solution

12. (A): Electron gain enthalpy of noble gases is very less (R): Atoms of noble gases have completely filled orbitals

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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13. (A) Atomicity of argon is unity

(R) Ratio of molar heat capacities of argon is 1.67

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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14. (A) Density of nitrogen obtained in chemical methods is more than that nitrogen separated from liquid air

(R) Density of atmospheric nitrogen is different than expected mainly because of water vapour.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D



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15. (A) Xenon tetrafluoride molecule is denoted as AB_4E_4 , where E is a lone pair

(R) All AB_4 type molecules have no dipole moment, because of symmetrical tetrahedral structure.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D



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16. (A) First ionisation potential of helium is highest

(R) The electron gain enthalpy of helium is taken as zero

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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17. (A) Valency of xenon in second excited state is two
(R) Xenon forms XeF_2 in its second excited electronic state

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: D



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18. (A) Boiling point of helium is least

(R) Intermolecular forces of attractions are almost

absent in helium

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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19. (A) All the noble gases have ns^2np^6 electronic configuration in their outermost shell

(R) In noble gases all the energy levels are completely filled.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D

20. (A) Helium is regarded as the least volatile of all liquids.

(R) The boiling point of liquid helium is 4.2 K which is the highest of all known liquids.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D



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21. (A) Deep sea divers use helium-oxygen mixture for respiration

(R) Unlike nitrogen, helium is not soluble in blood even under high pressure.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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22. (A) Xenonmonoxytetrafluoride has square planar structure.

(R) Xenon in $XeOF_4$ undergoes dsp^2 hybridisation.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D



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23. (A) Group 18 elements are called noble gases

(R) group 18 elements form only very few compounds

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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24. (A) All noble gases occur in atmosphere

(R) Among noble gases 'R' is radioactive element

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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25. (A) 1 lit of dry air contains 10ml of noble gas mixture

(R) The atmosphere abundance of noble gases in dry air is nearly 1%

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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26. (A) Helium is present in radio active minerals like pitchblende, monazite and cleveite

(R) The main commercial source of helium is natural gas

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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27. (A) 1 mole Ra^{226} on alpha disintegration will give 44.8 lit of gaseous product at S.T.P

(R) 1 mole Ra^{226} on alpha disintegration will give 1 mole radon and one mole helium

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A

28. (A) Noble gases have very high ionization enthalpies in periodic table

(R) All noble gases have stable octet configuration in their valence shell

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: C



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29. (A) Noble gas elements have very low melting and boiling points

(R) The interatomic attractions in noble gas elements are weak dispersion forces.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

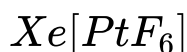
D. Both (A) and (R) are false

Answer: A



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30. (A) The first noble gas compound synthesised is



(R) Ionization enthalpy of Xe is almost equal to the ionization enthalpy of atomic oxygen

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: C



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31. (A) XeF_2 is a linear molecule

(R) $InXeF_2$ xenon undergoes sp^3d hybridization

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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32. The hydrolysis of XeF_6 is not a redox reaction

(R) XeF_6 on complete hydrolysis will give XeO_3

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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33. (A) XeO_3 is a colourless explosive solid

(R) XeO_3 has pyramidal structure

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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34. (A) Helium is preferred than hydrogen in filling ballons for meterological observations

(R) Helium is lighter than hydrogen and it is non-combustible in nature

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: C



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35. (A) The study of radon is difficult among noble gases

(R) Radon is radio active in nature

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not the correct explanation of (A)
- C. (A) is true but (R) is false
- D. Both (A) and (R) are false

Answer: A



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36. (A) Helium is used in gas cooled nuclear reactors

(R) Helium has high thermal conductivity

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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37. (A) Helium is used in modem diving apparatus

(R) Helium is chemically inert

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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38. (A) Neon bulbs are used in botanical gardens

(R) Neon is lighter than argon

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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39. (A) Liquid helium can be used as a cryogenic liquid
(R) Liquid helium can produce a very low temperatures
of around 4.2k

A. Both (A) and (R) are true and (R) is the correct
explanation of (A)

B. Both (A) and (R) are true and (R) is not the
correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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40. (A) XeF_4 reacts with SbF_5 to give a salt
 $[SbF_4]^+ [XeF_5]^-$

(R) SbF_5 acts as fluoride ion donor with XeF_4

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: D



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41. (A) 'Ar' is used for arc welding of metals or alloys.

(R) Ar provides an inert atmosphere for metal (or) alloys during arc welding

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



42. (A) Liquid helium is used in NMR spectrometers and MRI systems

(R) Liquid helium can be used in making powerful super conducting magnets

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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43. On dissolution of Xenates $[HXeO_4]^-$ in alkaline solution perxenate and Xe are obtained

(R) Xenates show disproportionation in alkaline solution

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: A



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44. (A): The name helium is made after sun

(R): Helium is abundant gas in sun's chromosphere

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not the correct explanation of (A)

C. (A) is true but (R) is false

D. Both (A) and (R) are false

Answer: B



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Level I Exercise I

1. The chemistry of zero group elements is little known because

A. They are less abundant

B. They have low ionisation potential

C. They have octate condiguration

D. They have low boiling points

Answer: C



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2. The gaseous mixture present in the 'Sun' atmosphere

A. Ar, Kr, Xe

B. Ne, Kr

C. Kr, Xe

D. He, H_2

Answer: D



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3. Helium gives characteristic spectrum with orange light which is similar to that of



Answer: A



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4. In Ramsay - Rayleigh first method, which of the following are used to remove CO_2 , O_2 and N_2 respectively

- A. Soda lime + Potash solution, red hot Cu & heated Mg
- B. Soda lime, heated Mg & red hot Cu
- C. Soda lime, red hot Cu_2O & heated Mg
- D. Soda lime + Potash soln, red hot CuO & heated Mg

Answer: B



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5. Traces of oxygen from the fraction of Ar and O_2 is removed by passing over heated



Answer: C



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6. In ramsay - Raylighs second method, the mixture of N_2 and O_2 can be seperated by dissolving in NaOH in the form of

A. Nitrates

B. Nitrides

C. Oxides

D. Amides

Answer: A



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7. Mixture of inert gases can be separated by

- A. Electrolysis of their compounds
- B. Fractional distillation of air
- C. adsorption and desorption by coconut charcoal
- D. Sublimation

Answer: B



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8. The wrong statement regarding Dewars method of separation of noble gases is

- A. All Inert gases can be adsorbed over charcoal

- B. Lower the atomic number of the gas, lower is the temp needed to adsorb it
- C. heavier gases have greater degree of adsorption
- D. He cannot be adsorbed over charcoal

Answer: A



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9. The forces that make the molecules of a noble gas in liquid state

A. Dipolar forces

B. Dipole- induced dipole forces

C. Van der waal's force

D. Repulsive forces

Answer: C



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10. The use of pyrogallol in Ramsay - Rayleigh second method is

A. to absorb O_2

B. to absorb noble gas mixture

C. to absorb CO_2

D. to absorb O_2 , CO_2 & N_2

Answer: A



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11. Coconut charcoal at 93K is used to separate

A. Ar and Kr

B. Ne and Kr

C. He and Kr

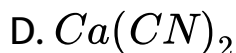
D. He and Ne

Answer: D



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12. is the compound which can remove both nitrogen and oxygen of the air when it is passed over it at $1000^{\circ}C$:



Answer: A



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13. Ramsay - Rayleigh second method is based on

A. Conversion of O_2 to CuO

B. Conversion of N_2 to Mg_3N_2

C. Conversion of O_2 and N_2 into oxides of
nitrogen

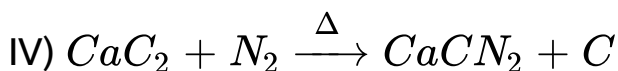
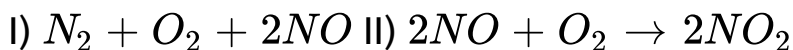
D. all

Answer: C



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14. Regarding the isolation of noble gases from atmospheric air by Ramsay - Rayleigh's second method four equations are given below



In this method, the reactions truly involved are

A. Both I and II

B. Both II and III

C. I, II and III

D. III and IV

Answer: C



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15. The following are some statements regarding Claude's method

I : The boiling point of Ar is nearer to O_2

II : N_2 is removed as $CaCN_2$

III : O_2 is removed as MgO

IV : From a mixture of He and Ne, Ne is removed by liquifaction with liquid hydrogen

The correct statements are

A. Both I and II

B. Both I and III

C. Both I and IV

D. I, II and IV

Answer: D



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16. (A) : Helium was discovered in chromosphere of the sun

(R) : D_3 line is observed along with D_1 and D_2 in the solar spectrum

The correct answer is

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not correct explanation of (A)

C. (A) is true but (R) is false

D. (A) is false but (R) is true

Answer: A



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17. (A) : In the separation of inert gases, by Dewar's method He gas does not absorbed on activated charcoal

(R) : Among noble gases helium has less atomic size

The correct answer is

- A. Both (A) and (R) are true and (R) is the correct explanation of (A)
- B. Both (A) and (R) are true and (R) is not correct explanation of (A)
- C. (A) is true but (R) is false
- D. (A) is false but (R) is true

Answer: A



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18. The first ionization energy of neon is 2080.7 KJ/mole. The first of ionisatioin energy of helium may

be

A. 2080.7 KJ/mole

B. 2372.3 KJ/mole

C. 1520.5 KJ/mole

D. 1800.4 KJ/mole

Answer: B



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19. The noble gas which behaves abnormally in liquid state is

A. Xe

B. Ne

C. He

D. Ar

Answer: C



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20. The solubility of noble gases in water shows the order :

A. $He > Ne > Ar > Kr > Xe$

B. $He > Ne > Kr > Ar > Xe$

C. $Xe > Kr > Ar > Ne > He$

D. none

Answer: C



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21. The compound which will not exist is

A. XeF_2

B. XeF_4

C. XeF_6

D. XeF_8

Answer: D



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22. The ratio of σ and π bonds present in XeO_4 molecule is

A. 2 : 3

B. 1 : 2

C. 2 : 1

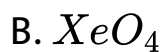
D. 1 : 1

Answer: D



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23. Which of the following compound is both hygroscopic and explosive



Answer: C



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24. In XeF_6 molecule, Xenon atom undergoes

- A. sp^3d^2 hybridisation in its 2nd excited state
- B. sp^3d^3 hybridisation in its 2nd excited state
- C. sp^3d^3 hybridisation in its 3rd excited state
- D. sp^3d^3 hybridisation in its 4th excited state

Answer: C



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25. (A): Among noble gases Xe can readily form compounds with fluorine

(R): Among noble gases, Xe has lesser ionisation potential

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true and (R) is not correct explanation of (A)

C. (A) is true but (R) is false

D. (A) is false but (R) is true

Answer: A



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26. In XeF_4 molecule

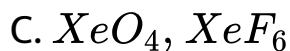
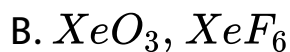
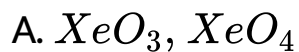
- A. 4 bond pairs occupy equatorial positions & 2 lone pairs occupy axial positions
- B. 2 bond pair occupy equatorial position & 4 lone pairs occupy axial positions
- C. All the electron pairs are arranged in tetrahedral manner
- D. 4 bond pairs occupy equatorial position & 1 lone pair occupies axial position

Answer: A



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27. The explosive compounds are



Answer: A



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28. The bond angle in XeO_3 molecule decreases from $109^\circ 28'$ to 103° due to

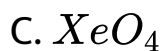
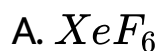
- A. greater repulsions among lone pairs
- B. greater repulsions among l.p and b.p
- C. greater repulsions among bond pairs
- D. steric effect

Answer: B



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29. The compound in which there is no lone pair on xenon atom is



Answer: C



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1. When a Radioactive substance is kept in a vessel, the atmosphere around it is rich with

A. He

B. Ne

C. Ar

D. Xe

Answer: A



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2. Which element disintegrates to give two noble gases

A. Ra

B. Th

C. Rn

D. He

Answer: A



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3. The actual density of nitrogen is 1.2519 lit^{-1} . The density of nitrogen obtained from the atmosphere is $1.2572 \text{ g lit}^{-1}$. This is because of the fact that atmospheric nitrogen contain

A. Argon and other noble gases

B. Carbon dioxide

C. Neon

D. Carbon monoxide

Answer: A



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4. The percentage by volume of Argon in atmosphere

A. 0.01

B. 0.02

C. 0.1

D. 0.002

Answer: A



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5. Noble gases exist only in monoatomic state. This is due to

A. Non availability of unpaired electrons

B. high ionization energy

C. large size

D. zero electron affinity

Answer: A



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6. If one litre of air is passed repeatedly over heated copper and magnesium till no further reduction in volume takes place, the volume finally obtained is

A. 800ml

B. 990 ml

C. 10 ml

D. 100 ml

Answer: C



[Watch Video Solution](#)

7. When 1 lit of air is burnt with a mixture calcium carbide and anhydrous calcium chloride, the reduction in volume of air is about

A. 10 ml

B. 990 ml

C. 100 ml

D. 900ml

Answer: B



[Watch Video Solution](#)

8. The incorrect statement regarding to Noble gases is
- A. Their Electron affinity and Electronegative are zero
 - B. They are held together by Van der Waals forces
 - C. They occupy the Peaks in the graphs of ionisation potential and atomic number
 - D. Their boiling points decrease from He to Xe

Answer: D



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9. The maximum valency (=8) is shown by

A. Xe, Os

B. Xe, Ru

C. Xe, Os, Ru

D. Xe, Os, Ru, Mn

Answer: C



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10. Which of the following is diamagnetic?

A. O_2



Answer: C



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11. The compound of Xenon with highest bond angle and zero dipole moment



D. XeF_4

Answer: A



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12. Regarding XeF_2 , the correct combination is (L.P = lone pairs μ = Dipolemoment)

A. $sp^3d - 3L. P - \mu \neq 0$

B. $sp^3d - 3L. P - \mu = 0$

C. $sp^3d - 2L. P - \mu = 0$

D. $sp^3d - 2L. P - \mu = \neq 0$

Answer: B



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13. The fact helped the preparation of first compound of Xenon

A. High bond energy of $Xe - F$

B. Low bond energy of F - F in F_2

C. Ionisation energies of O_2 and xenon were almost similar

D. None of these

Answer: C



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Level I Exercise Iii

1. Which of the following statements about noble gases are correct.

I: XeO_3 is an explosive tetrahedral molecule.

II : In Fischer Ringe method, a mixture of $CaCl_3$ and CaC_2 is used to remove N_2 and O_2 .

III : He and Ne are chemically inert due to lack of d-orbitals and high ionisation potential.

IV: At 173 K He and Ne are adsorbed on 'activated charcoal'.

The correct answer i

A. I and II

B. II and III

C. II, III and IV

D. I, II , III and IV

Answer: B

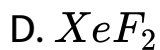


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2. The compound in which the number of dit - px bonds are equal to those present in ClO_4^- , is

A. XeF_4

B. XeO_3



Answer: B



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Level II Lecture Sheet Exercise I Single One Or More Than One Correct Answers

1. The inert gas obtained from monazite sand is :

A. He

B. Ne

C. Ar

D. Kr

Answer: A



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2. The gas with lowest boiling point is:

A. Hydrogen

B. Helium

C. Nitrogen

D. Argon

Answer: B



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3. A noble gas which is not adsorbed by coconut charcoal is

A. He

B. Ne

C. Ar

D. Ra

Answer: A



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4. In solid argon, the atoms are held together by

- A. ionic bonds
- B. hydrogen bonds
- C. vanderwaal's forces
- D. London forces

Answer: C::D



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5. The source of most of the noble gases is:

- A. decay of radioactive minerals
- B. The atmospheric air
- C. The natural gases coming out of the earth
- D. The decay of the rocks

Answer: B



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6. Which of the following compounds cannot be prepared by direct reaction between the constituent elements





Answer: C::D



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7. Compounds which contain two lone pairs and four bonds pairs are





Answer: B::C



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8. Compounds which contain one lone pair and six bond pairs are



Answer: A::C::D



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9. Correct statements regarding XeO_3 & XeO_4

A. Both XeO_3 , XeO_4 are explosive solids

B. Both XeO_3 , XeO_4 are hygroscopic

C. XeO_3 , is more stable than XeO_4

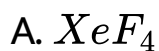
D. Both XeO_3 and XeO_4 are formed by sp^3
hybridisation

Answer: A::C::D



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10. Which of the following compounds are formed by sp^3d hybridisation

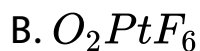
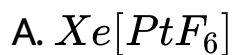


Answer: B::D



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11. Write the name and formula of the first noble gas compound prepared by Bertlett.

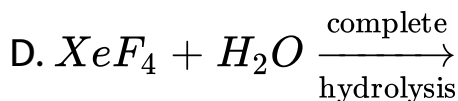
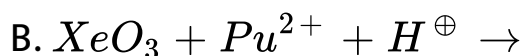


Answer: A



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12. Which one of following is a disproportionation reaction?



Answer: A::D



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1. Noble gases A, B, C, D, E are passed through Dewar's flask at -100°C . A, C & E gases are adsorbed. Unadsorbed gases B, D are passed through another Dewar's flask at -180°C . Gas B is adsorbed. The Dewar's flask at -100°C is put in contact with another Dewar's flask at -193°C . The gas E diffuses in it. Finally A & C are separated by warming the flask from -100°C to -90°C . Here 'C' comes out.

He and Ne gases respectively are

A. A, B

B. B, D

C. C, D

D, D, B

Answer: A



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2. Noble gases A, B, C, D, E are passed through Dewar's flask at $-100^{\circ}C$. A, C & E gases are adsorbed. Unadsorbed gases B, D are passed through another Dewar's flask at $-180^{\circ}C$. Gas B is adsorbed. The Dewar's flask at $-100^{\circ}C$ is put in contact with another Dewar's flask at $-193^{\circ}C$. The gas E is diffused in it. Finally A & C are separated by warming the flask from $-100^{\circ}C$ w -

90° C. Here 'C' comes out

He and Ne gases respectively are

A. Ne

B. Ar

C. Kr

D. Xe

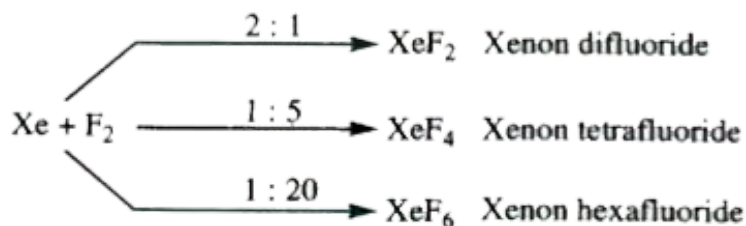
Answer: B



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3. Xenon Fluorides : Xenon reacts directly with fluorine on heating at 675 K in a sealed nickel tube. The

product obtained depends upon the amount of fluorine present.



XeF_2 reacts with SbF_5 to form

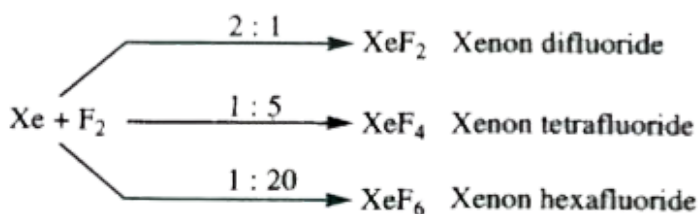
- A. $[\text{XeF}]^+ [\text{SbF}_6]^-$
- B. $[\text{XeF}_3]^- [\text{SbF}_4]^-$
- C. $\text{Xe}^- [\text{PtF}_6]^+$
- D. XeF_4

Answer: A



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4. Xenon Fluorides : Xenon reacts directly with fluorine on heating at 675 K in a sealed nickel tube. The product obtained depends upon the amount of fluorine present.



XeF_6 on complete hydrolysis gives



Answer: D



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Level Ii Lecture Sheet Exercise Iii Match The Following Questions

1. Match the following columns

COLUMN-I

- A) He
- B) Ne
- C) Ar
- D) Kr

COLUMN-II

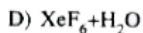
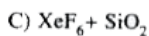
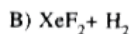
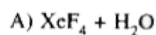
- p) New
- q) Sun
- r) Hidden
- s) Lazy



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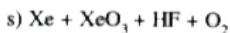
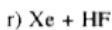
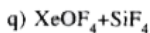
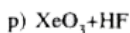
2. Match the following columns

COLUMN-I (Reaction)



(complete hydrolysis)

COLUMN-II (Product)

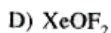
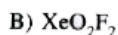


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3. Match the following columns

COLUMN-I

(compound)



COLUMN-II

(Oxidation Number)

p) +4

q) +2

r) +6

s) +8



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4. Match the following columns

COLUMN-I

(compound)

- A) XeF_2
- B) XeOF_2
- C) XeOF_4
- D) XeO_3

COLUMN-II

(Shape)

- p) Pyramidal
- q) T-shape
- r) Linear
- s) Square pyramidal



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5. Match the following columns

COLUMN-I

(compound)

- A) XeO_3
- B) XeOF_2
- C) XeO_4
- D) XeO_2F_2

COLUMN-II

(σ & π bonds)

- p) 4σ & 4π
- q) 3σ & 1π
- r) 3σ & 3π
- s) 5σ & 1π
- t) 4σ & 2π



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Level II Lecture Sheet Exercise IV Integer Answer Type Questions

1. The percentage abundance of Neon gas in air by volume is 1.8×10^{-x} and by weight is 1.0×10^{-y} .

Then $x - y = \underline{\hspace{2cm}}$



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2. Describe the Fischer - Ringe's method.



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3. Neon is mainly used in discharge tubes at a pressure of _____ mm



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4. $XeF_6 + xH_2O \rightarrow XeO_3 + yHF$, the $\frac{y}{x} =$ _____



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5. $Xe + 2PtF_6 \xrightarrow{25^\circ C} [XeF]^+ [PtF_6]^- + PtF_5$ then in the complex compound Xe Oxidation state is "+ 2" then oxidation of $[PtF_6]$ is _____



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6. In XeF_4 molecule, the no. of lone pairs are x, the no. of sigma bonds are y and the no. of Pi bonds are z, then $x + y + z$ is _____



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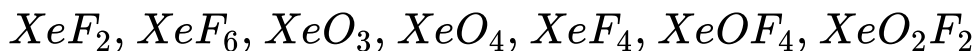
7. Number of following compounds in which central atom has "+6" oxidation state

XeF_2 , XeF_6 , XeO_3 , XeO_4 , XeF_4 , $XeOF_4$, XeO_2F_2



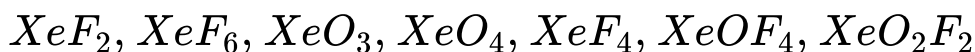
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8. Number of following compounds in which central atom has "+6" oxidation state



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9. Number of following compounds in which central atom has "+6" oxidation state



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10. In the Ramsay - Rayleigh's second method,
 $2NO_2 + 2NaOH \rightarrow NaNO_2 + X + H_2O$. Where 'X'
is the nitrogen compound, then Oxidation state of
nitrogen in 'X' is _____



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Practice Sheet 1 Single More Than One Option Questions

1. The first compound of a noble gas known is

A. 100 ml

B. 1 ml

C. 10 ml

D. 0.1 ml

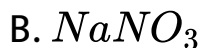
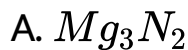
Answer: C



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2. Nitrogen in the air is removed in the form of _____

is fisher-Ringe method

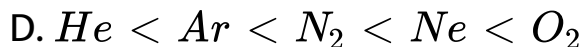
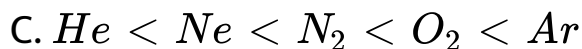
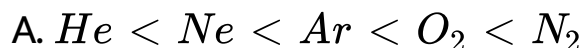


Answer: C



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3. Which order of Boiling points is correct



Answer: B



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4. Coconut charcoal at -100°C adsorbs a mixture of

A. He and Kr

B. Ar, Kr and Xe

C. Kr and Xe

D. He and Ne

Answer: B



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5. Which of the following is the least stable ?

A. He

B. Ne

C. Kr

D. Rn

Answer: A



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6. Which of the following does not react with fluorine :

A. Kr

B. Ar

C. Xe

D. All of these

Answer: B



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7. Which statement is false :

A. Radon is obtained from the decay of radium

B. Helium is an inert gas

C. The most abundant noble gas in the atmosphere
is He

D. Xe is the most reactive among the noble gases

Answer: C



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8. Which characteristic of zero group elements is common :

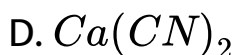
- A. Each of them has the same atomic number
- B. Each of them has the same atomic mass
- C. The outermost orbit of electron of each is saturated
- D. Each of them has the same number of electrons

Answer: C



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9. is the compound which can remove both nitrogen and oxygen of the air when it is passed over it at $1000^{\circ}C$:



Answer: A



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10. The solubility of noble gases in water shows the order :

A. $\text{He} > \text{Ar} > \text{Kr} > \text{Ne} > \text{Xe}$

B. $\text{He} > \text{Ne} > \text{Ar} > \text{Kr} > \text{Xe}$

C. $\text{Xe} > \text{Kr} > \text{Ar} > \text{Ne} > \text{Hg}$

D. $\text{He} > \text{Kr} > \text{Ar} > \text{Ne} > \text{Xe}$

Answer: C



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11. Which of the following names are used for group zero elements

A. Rare gases of atmosphere

B. Noble gases

C. Inert gases

D. Rare -earths

Answer: A::B::C



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12. The noble gases which do not form clathrates are

A. He

B. Ne

C. Kr

D. Xe

Answer: A::B



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13. Noble gases used in flash tubes for high speed photography are

A. Ne

B. Kr

C. Ar

D. Xe

Answer: B::D



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14. Pick out the correct statement/s about noble gases

- A. 'He' cannot be used in preference to nitrogen(N)
to dilute the oxygen in the gas cyclinders used
by divers.
- B. 'He' is used in weather balloons and airships.

C. 'He' is used in cryoscopy to obtain the very low temperatures required for superconductivity and lasers.

D. 'Ar' is used in metallurgical processes.

Answer: B::C::D



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15. The noble gases heavier than air are

A. Ar

B. He

C. Ne

D. Kr

Answer: A::C



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16. The only known true chemical compounds of noble gases are with

A. F

B. O

C. N

D. S

Answer: A::B



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Practice Sheet 1 Linked Comprehension Type Questions

1. Pure and dry Air is passed over soda lime and potash solution and then through a long tube containing red hot copper. The remaining air is passed over heated magnesium ribbon

Which of the following are removed when air is passed through soda lime and potash

A. O_2

B. N_2

C. CO_2

D. CO_2 and water vapour

Answer: C



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2. Pure and dry Air is passed over soda lime and potash solution and then through a long tube containing red hot copper. The remaining air is passed over heated magnesium ribbon

Which of the following are removed when air is passed through soda lime and potash

A. CuO

B. CO_2

C. HgO

D. Both CuO & MgO

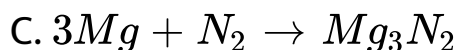
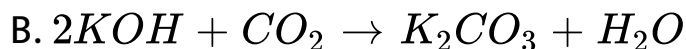
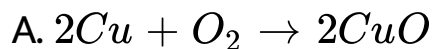
Answer: D



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3. Pure and dry Air is passed over soda lime and potash solution and then through a long tube containing red hot copper. The remaining air is passed over heated magnesium ribbon

Which of the following are removed when air is passed through soda lime and potash



Answer: D



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4. Various constituents of liquid possess different boiling points, So they can be separated by fractional

distillation. It can be done by using Claude's apparatus.

When condensed air passed through Claude's apparatus, both oxygen and Nitrogen get condensed separately. He and Ne are collected with liquid nitrogen. Ar, Kr, Xe are collected with liquid oxygen.

After removal of N_2 by heating with CaC_2 He & Ne are cooled to 20 K with liquid H_2 . After removal of O_2 with Cu, Ar, Kr, Xe are cooled with liquid nitrogen and Ar separated out. Finally liquid Kr and Xe can be separated by fractional distillation :

In this process the chemical that is not involved

A. He, Xe

B. He, Ne

C. Ar, O_2

D. N_2 , O_2

Answer: C



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5. Various constituents of liquid possess different boiling points, So they can be separated by fractional distillation. It can be done by using Claude's apparatus. When condensed air passed through Claude's apparatus, both oxygen and Nitrogen get condensed separately. He and Ne are collected with liquid nitrogen. Ar, Kr, Xe are collected with liquid oxygen. After removal of N_2 by heating with CaC_2 He & Ne are

cooled to 20 K with liquid H_2 After removal of O_2 with Cu, Ar, Kr, Xe are cooled with liquid nitrogen and Ar separated out. Finally liquid Kr and Xe can be separated by fractional distillation :

In this process the chemical that is not involved

- A. graphite
- B. Calcium cyanamide
- C. Nitrolim
- D. Calcium cyanide

Answer: D



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6. Various constituents of liquid possess different boiling points, So they can be separated by fractional distillation. It can be done by using Claude's apparatus. When condensed air passed through Claude's apparatus, both oxygen and Nitrogen get condensed separately. He and Ne are collected with liquid nitrogen. Ar, Kr, Xe are collected with liquid oxygen. After removal of N_2 by heating with CaC_2 He & Ne are cooled to 20 K with liquid H_2 After removal of O_2 with Cu, Ar, Kr, Xe are cooled with liquid nitrogen and Ar separated out. Finally liquid Kr and Xe can be separated by fractional distillation :

In this process the chemical that is not involved

A. liquid O_2

B. CuO

C. Both as liquid O_2 & CuO

D. CO_2

Answer: C



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Practice Sheet 1 Match The Following Questions

1. Match the following columns

COLUMN - I

- A) He
- B) Ne
- C) Ar
- D) Kr

COLUMN- II

- p) glow lamps
- q) Miner's cap lamps
- r) Heat Transfer Agent
- s) Filled in the Balloons



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2. Match the following columns

COLUMN - I

- A) He
- B) Rn
- C) Ne
- D) Ar

COLUMN- II

- p) Treatment of cancer
- q) Used in minors cap lamp
- r) Filled in the oxygen cylinders of sea divers
- s) Filled in electric bulbs



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Practice Sheet 1 Integer Answer Type Questions

1. The group of radio active element which can decay to give two noble gases is _____



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2. In Dewar's process coconut charcoal at 93K is used to separate the two noble gases with atomic No. s X & Y then $\frac{X + Y}{4} = \text{-----}$



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3. The temperature at which the gases Xe, Ar, Kr are adsorbed on charcoal in Dewar's method is -----
 $\times 43.25K$



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4. Atomic number of noble gas used in Beacon lamp is Y,

then $\frac{Y}{2} = \text{-----}$



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5. The simple ratio of a mixture of the He and O_2 is

used for the respiration for deep sea divers -----



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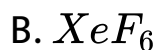
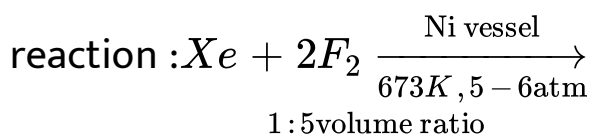
6. The no. of core electrons in the "new" gas -----



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Practice Sheet 2 Single More Than One Option Questions

1. Which compound is prepared by the following



Answer:



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2. Geometry of $XeOF_4$ molecule is :

- A. Square planar
- B. Square pyramidal
- C. Triangular bipyramid
- D. Tetrahedral

Answer:



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3. XeF_4 exists as under ordinary atmospheric conditions:

A. Solid

B. Liquid

C. Gas

D. Semi solid

Answer:



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4. The compound that attacks pyrex glass is :

A. XeF_2

B. XeF_4



Answer:



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5. Which of the following pairs of xenon compounds and their structure are correctly matched?

1) XeF_4 Tetrahedral

2) XeO_3 Trigonal pyramidal

3) XeOF_4 Square pyramidal

4) XeO_4 Tetrahedral

Select the correct answer using the codes given below

: Code :

A. 1,2,3 and 4

B. 2, 3 and 4

C. 1 and 3

D. 3 and 4

Answer:



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