

Oxygen Chemistry Questions with Solutions

Q1. Which chemical can be used in the laboratory to make oxygen?

- (a) Hydrochloric Acid
- (b) Hydrogen peroxide
- (c) Sodium hydroxide
- (c) All of the above

Answer: (b) We can use hydrogen peroxide to make oxygen in the laboratory.

Q2. What catalyst is usually used in the laboratory to speed up oxygen production?

- (a) Iron
- (b) Vanadium (V) oxide
- (c) Manganese (IV) oxide
- (d) None of the above

Answer: (c) Manganese (IV) oxide catalyst is usually used in the laboratory to speed up oxygen production.

Q3. Oxygen belongs to which block of the periodic table?

- (a) s block element
- (b) p block element
- (c) d block element
- (d) None of the above

Answer: (b) Oxygen belongs to the p block element.

Q4. Which of the following is the main source of oxygen in our environment?

- (a) Phytoplanktons
- (b) Zooplanktons
- (c) Fungi
- (d) None of the above

Answer: (a) Phytoplanktons is the main source of oxygen in our environment.

Q5. How much oxygen is present in the atmosphere?

- (a) 21%
- (b) 1%
- (c) 71%
- (d) None of the above

Answer: (a) 21% of the oxygen is present in the atmosphere.

Q6. Oxygen belongs to which group of the periodic table?

- (a) Halogen Group
- (b) Chalcogen Group
- (c) Nobel Gases Group
- (d) None of the above

Answer: (b) Oxygen belongs to the chalcogen group of the periodic table.

Q7. What are the industrial applications of oxygen?

Answer: Oxygen plays an important role in the survival of human beings. It has a lot of industrial applications. A few of them are enlisted below.

1. Oxygen is used in mining and is used to manufacture glass and stone products.
2. Oxygen is used to melt, refine and manufacture steel.

Q8. What is the electronic configuration of oxygen?

Answer: The electronic configuration of oxygen is $1s^2 2s^2 2p^4$.

Q9. Explain oxygen in detail.

Answer: Oxygen is a chemical element of group 16 of the modern periodic table. It is represented by the symbol O and has an atomic number of 8. It is a highly reactive non-metal and promotes combustion. Oxygen acts as an oxidising agent and forms oxides readily.

Q10. What is the oxygen cycle?

Answer: The oxygen cycle is a biogeochemical cycle which is involved in the circulation of the oxygen atoms in the atmosphere through a sequence of complex approaches. It explains the usage and balance of oxygen in the atmosphere.

Q11. Is there any isotope of oxygen? If yes, name them.

Answer: Yes, there are three primary oxygen isotopes, namely, O^{17} , O^{18} , and O^{19} .

However, there are fifteen radioactive isotopes of oxygen ranging from O^{11} to O^{28} . These radioactive oxygen isotopes are short-lived.

Q12. What are the different allotropes of oxygen?

Answer: There are numerous oxygen allotropes. However, significant dioxygen (oxygen gas) and tri oxygen (ozone) are present in the atmosphere. Various other oxygen allotropes are enlisted below.

1. $O\cdot$ (Oxygen free radical)
2. O_2^* (Metastable state of molecular oxygen)
3. O_4 (Metastable state of tetra oxygen)
4. O_8 (Solid oxygen)

Q13. State any four physical properties of oxygen.

Answer: The physical properties of oxygen are as follows.

1. Oxygen is a colourless, odourless and tasteless gas.

2. Oxygen can be changed from a gaseous state to a liquid state under high pressure and low temperature. Liquified oxygen is slightly blue coloured.
3. Oxygen is paramagnetic.
4. Oxygen is practically insoluble in water.

Q14. What happens when an alkali metal reacts with oxygen?

Answer: Metal reacts with oxygen to form basic metallic oxide.

Reaction: $M + O_2 \rightarrow MO_2$

Q15. What is the oxidation number of oxygen in H_2O_2 ?

Answer: Oxygen has - 1 oxidation number in H_2O_2 .

Practise Questions on Oxygen

Q1. What are the different stages of the oxygen cycle?

Answer: The different stages of the oxygen cycle are:

Stage 1: All green plants, during photosynthesis, release oxygen into the atmosphere as a by-product.

Stage 2: All aerobic organisms use free oxygen for respiration.

Stage 3: Animals exhale Carbon dioxide back into the atmosphere, which the plants again use during photosynthesis.

Q2. What is an isotope?

Answer: Isotopes are atoms with the same atomic number but different mass numbers.

Example: Protium (${}_1H^1$), Deuterium (${}_1H^2$), and Tritium (${}_1H^3$).

Q3. What is an allotrope?

Answer: Allotropes are two or more states of the same element existing in an identical physical state that differ in the arrangement of atoms in crystalline solids or in the occurrence of molecules that contain different numbers of atoms.

Q4. What is an atomic number?

Answer: Atomic number tells us about the number of protons a chemical element has in the nucleus of an atom. It is represented by the letter Z.

Q5. Ozone plays an important role in protecting us. Justify your answer.

Answer: Ozone acts as a barrier between the earth and the harmful ultraviolet rays. If the ozone layer were absent in the stratosphere, we would be more prone to skin cancer, cataracts, and weak immune systems.