

Eutrophication Chemistry Questions with Solutions

Q-1: What happens when algae growth deoxygenates the water?

- a) Increase in the population of aquatic animals
- b) Animal mortality
- c) Biomagnification
- d) Increase in aquatic plants

Answer: b) Animal mortality

Explanation: Algae development is aided by the addition of phosphates to water. The abundance of algae growth covers the water surface, lowering the oxygen concentration in the water. This results in anaerobic conditions, which are often accompanied by the accumulation of toxic degradation and animal mortality.

Q-2: What is anthropogenic eutrophication? How is it caused?

Answer: Human activity causes anthropogenic eutrophication. Humans provide nutrients in the form of fertilisers to agricultural farms, golf courses, and lawns. Rains wash these fertilisers away, and they eventually end up in bodies of water like lakes and rivers. When fertilisers are introduced to an aquatic ecosystem, they provide abundant nutrients to algae and plankton, causing eutrophication of the water body.

Q-3: What is an algal bloom?

Answer: An algal bloom, also known as an algae bloom, is a fast proliferation or aggregation of algae in freshwater or marine water systems, which is commonly characterised by water discoloration of their colours.

Q-4: Eutrophication is less likely to occur in the area

- a) That are surrounded by fertilised lands
- b) Algal bloom is already present.
- c) There are numerous aquatic animals
- d) Which are not surrounded by fertile lands

Answer: d) Which are not surrounded by fertile lands

Explanation: The fertilisers contain phosphorus as additives which provide an abundance of nutrients to algae and plankton, causing the water body to become eutrophicated.

Q-5: Is eutrophication a natural process?

- a) Yes, it occurs naturally when glaciers retreat over generations.
- b) Yes, it happens naturally over millennia as lakes age and sediment settles in.
- c) No, all lakes are oligotrophic.
- d) None of the above

Answer: b)

Explanation: Eutrophication is a natural process. Many lakes accumulate nutrients, sediment, and plant material as they age over generations, slowly filling the lake basin. The process eventually comes to an end, and the basin is colonised by terrestrial plants. Natural eutrophication occurs at different times depending on the basin, watershed, and climate factors.

Q-6: The another term used for eutrophication is

- a) Dystrophication
- b) Hypertrophication
- c) All of the above
- d) Simplification

Answer: c) All of the above

Explanation: Dystrophication or hypertrophication are other terms for eutrophication.

Q-7: Write out the five ways for avoiding eutrophication.

Answer: Eutrophication can be prevented by:

- The use of effective filter habitats to remove nitrogen and phosphorus from runoff water.
- Water oxygenation is used to help restore ecological conditions by minimising the negative impacts of eutrophication, such as oxygen scarcity and the production of anaerobic hazardous chemicals.
- Farming operations should be rationalised through effective fertilisation planning and the use of slow-release fertilisers.
- Alternative animal husbandry approaches are used to reduce wastewater generation.
- Installation of tertiary treatment systems to minimise nutrient concentrations and improve wastewater treatment plant purification performance.

Q-8: Fill in the blanks

- a) Nitrate and phosphate fertilisers should be substituted with _____.
- b) Eutrophication is highly associated with the poisoning of _____.
- c) _____ conditions are created by eutrophication.
- d) Anthropogenic eutrophication is also known as _____ eutrophication.
- e) Algal bloom is another name of _____.

Answers:

- a) Compost manures
- b) Shellfish
- c) Anaerobic
- d) Cultural
- e) Phytoplankton

Q-9: Eutrophication causes aquatic species to die by

- a) Building up carbon dioxide in water
- b) Causing Lack of nitrogen in water
- c) Causing Lack of oxygen in water
- d) Causing lack of CO₂ in water

Answer: c) Causing Lack of oxygen in water

Q-10: DO levels fall during eutrophication because

- a) It is used by bacteria to degrade organic matter.
- b) It is used by algae during photosynthesis.
- c) It reacts with hydrogen to form water
- d) Aquatic plants use it up for respiration.

Answer: a) It is used by bacteria to degrade organic matter

Explanation: Algae in eutrophic lakes are deprived of light. When algae lack sufficient light, they stop creating oxygen and begin to consume it. Furthermore, when huge blooms of algae die, bacterial decomposers lower oxygen levels even further.

Q-11: Lower BOD signifies

- a) More oxygen is removed from water

- b) Less oxygen is removed from water
- c) Water is pure
- d) More carbon dioxide is dissolved in water

Answer: b) and c)

Explanation: The Biological Oxygen Demand, or BOD, is the amount of oxygen required by decomposing bacteria to digest organic matter in water. The amount of organic matter present in the water indicated water contamination. As a result, BOD also signals water contamination.

Higher BOD means more oxygen is needed, which means less oxygen is available for oxygen-hungry organisms to eat, and lower water quality. Low BOD, on the other hand, indicates that less oxygen is taken from water, making it purer.

Q-12: Harmful algal bloom is caused by the algae

- a) Pyrrophyta
- b) Rhodophyta
- c) Cyanobacteria
- d) Xanthophyta

Answer: c) Cyanobacteria

Q-13: The probability of _____ increases when P and N build up

- a) Phytoplankton
- b) Dissolved oxygen
- c) Oxygenation
- d) Higher BOD

Answer: a) and d)

Explanation: Eutrophication is a term used to describe a rise in nutrients like nitrogen and phosphorus that promote algae growth. Water quality can be affected depending on the degree of eutrophication. Increased phytoplankton biomass, for example, can lower clarity, light levels, and oxygen levels in the lake (Higher BOD), all of which have severe repercussions for the creatures that dwell there.

Q-14: What is DO? Why is it important?

Answer: The amount of oxygen dissolved in water is known as dissolved oxygen (DO).

One of the most important markers of water quality is dissolved oxygen (DO). It is necessary for fish and other aquatic species to survive. The aerating action of winds causes oxygen to dissolve in surface water. Aquatic plant photosynthesis releases oxygen into the water as a byproduct.

Q-15: When it's well known that algae create oxygen, how does eutrophication actually lower oxygen levels?

Answer: True, algae produce oxygen, but only when enough light is available. Water clarity and underwater light are both reduced by eutrophication. Algae in eutrophic lakes are deprived of light. When algae lack sufficient light, they cease creating oxygen and begin to consume it. Furthermore, when huge blooms of algae die, bacterial decomposers lower oxygen levels even further. As a result, eutrophication can swiftly deplete a lake's oxygen supply, resulting in an anoxic and potentially fatal underwater environment.

Practise Questions on Eutrophication

Q-1: Which of the following factor is responsible for algal bloom?

- a) High temperature
- b) Presence of dead organic matter
- c) Excess of nutrients
- d) All of the above

Answer: d) All of the above

Q-2: Which of the following is not an effect of hypoxia?

- 1) Aquatic animals killing
- 2) Dead zones
- 3) Capital issues
- 4) Bloom infested water

Answer: 3) Capital issues

Explanation: A shortage of oxygen in your tissues is referred to as hypoxia. Hypoxia in the aquatic system occurs when aquatic organisms are deprived of oxygen and nutrients. Hypoxia is usually associated with algal blooms which as a result can create dead zones.

Q-3: Chemical phosphorus precipitation can be done by adding _____ salts to water.

- a) Calcium
- b) Iron
- c) Aluminium
- d) All of the above

Answer: d) All of the above

Explanation: Chemical phosphorus precipitation involves adding iron or aluminium salts or calcium carbonate to water, which causes the orthophosphates of iron, aluminium, or calcium to precipitate, minimising the deleterious consequences of high phosphorus levels in the sediments.

Q-4: Define the terms

- a) Harmful algal bloom
- b) Dead zones

Answer:

- a) **Harmful algal bloom:** A harmful algal bloom occurs when some forms of algae bloom are in huge quantities and create compounds, such as toxins. Harmful algal blooms can occur in lakes, reservoirs, rivers, ponds, bays, and coastal waterways, and the toxins they create are dangerous to humans and aquatic life.
- b) **Dead zones:** Dead zones are sections of water bodies with low oxygen levels, making aquatic life impossible to exist. Significant nutrient pollution is the most common cause of dead zones.

Q-5: Name a lake from the 1960s where eutrophication reached its highest point.

Answer: Lake Erie

Explanation: In the 1960s, eutrophication had reached such a high level that Lake Erie, the smallest and shallowest of the Great Lakes, was deemed a dead lake. Eutrophication has negative consequences, but it also poses a risk to human health in the form of hazardous algal blooms.