

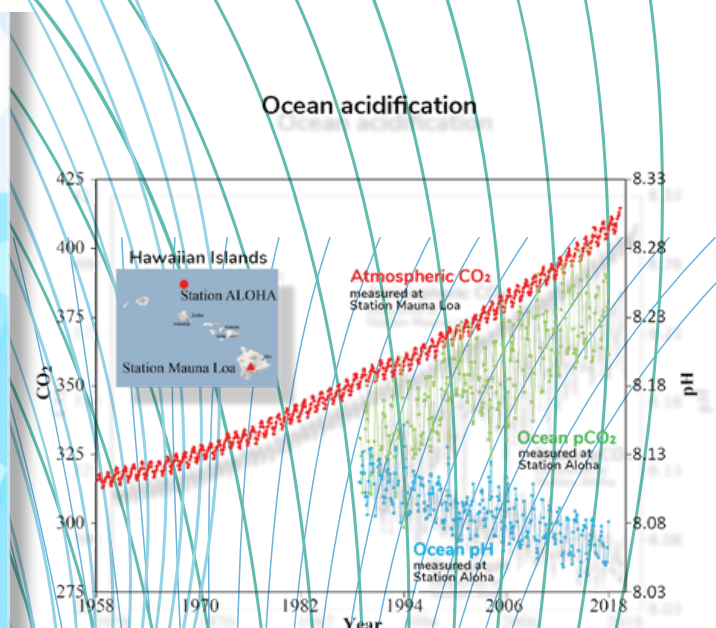
Impact of Ocean Acidification

1. What is Ocean Acidification ?

- Absorption of large amounts of carbon dioxide (CO_2) by the ocean. When CO_2 dissolved in seawater, it forms carbonic acid and release hydrogen ions (H^+), causing the pH value of the seawater to drop and the acidity increase.

2. What is the factor of ocean acidification?

- Burning of fossil fuel (coal, oil) release a large amounts of carbon dioxide
- Carbon dioxide react with seawater to form carbonic acid (H_2CO_3) which in turn releases hydrogen ion (H^+) and bicarbonate ions (HCO_3^-)
- Industrial and agricultural wastewater discharge, such as nitrogen and sulphur compounds (SO_2 , CO_2), introduce acidic substances into the ocean



3. What are the impacts?

- Threatens marine life, especially organisms relying on calcium carbonate (e.g., corals, mollusks).
- Diatoms (essential phytoplankton) produce oxygen and contribute to every fifth breath.
- Diatoms face challenges from changing pH levels, hindering growth.
- Shellfish (e.g., oysters, clams) struggle to form shells in acidic waters.
- Fish species (e.g., clownfish) may experience altered behavior and impaired development.
- Impact on survival rates of affected fish species.
- Marine mammals (e.g., sea turtles) depend on healthy ecosystems threatened by acidification.

4. What are the problems when they die ?

- Decline of species leads to reduced oxygen (O₂) levels in water.
- Affects fish and other marine life reliant on healthy oxygen supply.
- Diverse ecosystems (e.g., coral reefs) provide habitat for numerous species.
- Support coastal economies dependent on fishing and tourism.
- Mitigating effects requires global action to reduce CO₂ emissions.
- Protecting coastal ecosystems is essential.
- Addressing ocean pH reduction is vital for marine life health.
- Important for communities dependent on marine resources.



5. How to solve it?

- The essential solution is to reduce carbon dioxide emissions.
- **For Industrial Emissions:**
 - Use scrubbers in industrial plants to remove up to 95% of sulphur dioxide.
 - Process: Powdered limestone (calcium carbonate) is added to hot gases.
 - Heat decomposes limestone into lime (calcium oxide).
 - Lime reacts with sulphur dioxide to form calcium sulphite (CaSO_3).
 - Calcium sulphite reacts with air to form calcium sulphate.
- **Overall Goal of the Process:**
 - Reduce the amount of strong acid entering the ocean from the atmosphere.
 - Prevent the formation of sulphurous acid in seawater.
- **Biological Solution:**
 - Cultivate photosynthetic sea algae.
 - The algae absorb carbon dioxide and release oxygen through photosynthesis.



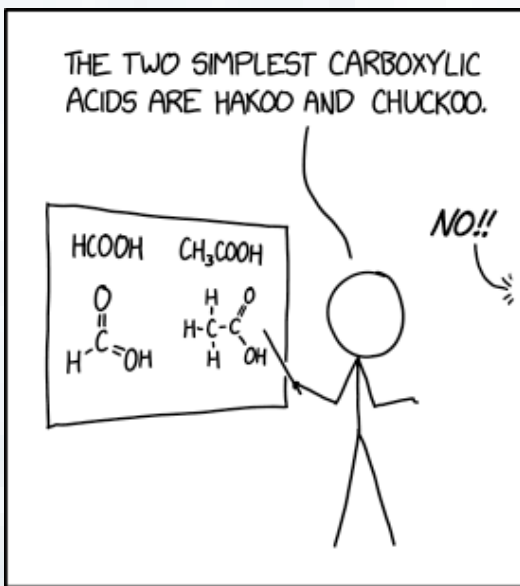
Monthly Quiz

If you answer all questions correctly, you will receive a small gift!

Deadline: 27/10/2025



Relaxing Zone



HOW TO ANNOY CHEMISTS

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Answer:

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