POLLUTION

Understanding Environmental Degradation and Its Impact on Our Planet

- Carbon Monoxide
- Acid Rain

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What is Pollution?

Undesirable Environmental Change

Physical, chemical, and biological characteristics altered

Excessive Pollutant Accumulation

Substances that harm land, air, and water systems

Human and Natural Origins

Both human made and natural Sources contribute

Types of Pollution

Air Pollution

Atmospheric contamination from gases and particles

Water Pollution

Contamination of rivers, lakes, and oceans

Land Pollution

Soil degradation and toxic waste accumulation

Noise Pollution

Excessive sound disrupting natural environments

AIR POLLUTION

Degradation of air quality and natural atmospheric conditions through harmful gases and particles

Sources of Air Pollution (Carbon Monoxide)

Industrial Sources

- Factory emissions: **Produce CO that reduces air quality and harms health.**
- Power plant smokestacks: **Emit CO from incomplete combustion, contributing to smog.**
- Chemical processing: **Releases carbon monoxide during fuel burning, adding to air pollution.**

Transportation

- Vehicle exhaust: **Major CO source, leading to urban air pollution.**
- Aircraft emissions: **Release CO at high altitudes, affecting air quality.**
- Ship fuel burning: **Produces CO over oceans, contributing to global air pollution.**

Carbon Monoxide : Effects

- Reduces oxygen delivery to body tissues.
- Causes headaches, dizziness, and fatigue.
- High levels can lead to unconsciousness or death.
- Harms people with heart and lung diseases more severely.
- Contributes to urban smog and poor air quality.

Carbon Monoxide (CO)

Source: Incomplete fossil fuel combustion in automobiles

Effect: Highly poisonous - reduces blood's oxygen capacity

Carbon Monoxide: The Silent Killer

Formation Process

Incomplete combustion of fossil fuels in automobiles and industrial processes

Health Impact

Binds to hemoglobin 200x stronger than oxygen, preventing oxygen transport

Danger Level

Colorless, odorless gas - undetectable without instruments

Acid Rain Formation

1

Step 1: Gas Emission

Sulfur dioxide and nitrogen oxides released into atmosphere

2

Step 2: Chemical Reaction

Gases oxidize to form sulfuric and nitric acids

3

Step 3: Acid Precipitation

Acids combine with water and fall as acid rain

Sources Of Acid Rain

- **Power plants** – burning coal and oil releases SO_2 and NO_x.
- **Factories/Industries** – emit SO_2 and NO_x during production processes.
- **Motor vehicles** – exhaust releases NO_x.
- **Oil refineries** – release SO_2 into the atmosphere.
- **Natural sources** – volcanoes, wildfires, and lightning produce some SO_2 and NO_x.

Acid Rain Damage

Building Materials

Corrodes stone, metal, and concrete structures

Plant Life

Burns leaves, damages root systems, stunts growth

Animal Life

Acidifies water bodies, harms aquatic ecosystems

Soil Quality

Increases soil acidity, reduces fertility

CONTROL OF AIR POLLUTION

01

Emission Standards

Strict regulations for industries and vehicles

02

Clean Technology

Catalytic converters and scrubber systems

03

Renewable Energy

Solar, wind, and hydro power alternatives

04

Individual Action

Public transport, energy conservation, awareness