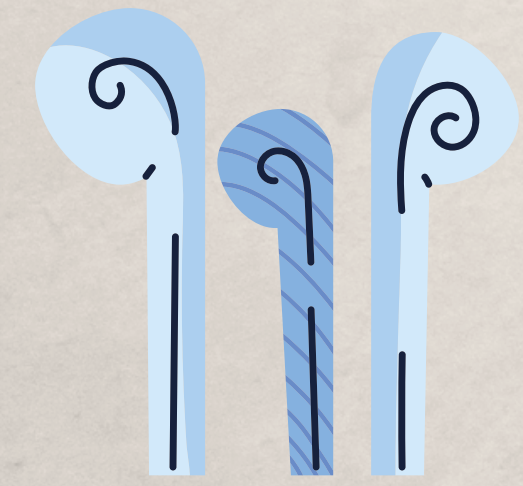


# **Module II-AIR POLLUTION**

## **Lecture 2:Primary & Secondary Air pollutants**

**Date:21/12/'20**

**Duration : 60 minutes**



# Learning Objectives

After attending the lecture one can understand the

- **Kinds of pollutants (present in the air)**
- **Their sources**
- **Classification and**
- **Properties**

# **Air pollution**

**An undesirable change in the physical/chemical/biological properties of Air due to Natural or Anthropogenic activities .**

# Air pollution

## PAST EPISODES

- 1984 Bhopal Disaster in India-took away the life of 3787 people and injured 1,50,000 to 6,00,000
- 1979- accidental spillage of antrax spores-USSR-64 died
- **1952-Great Smog-London-4000 to 12000 died just in 6 days**
- **Donora, Pennsylvania-October-1948 -The 1948 Donora smog killed 20 people and caused respiratory problems for 7,000 people of the**

# What researches are saying!

- India has the highest death rate due to air pollution.[49] India also has more deaths from asthma than any other nation according to the World Health Organization.
- Annual premature European deaths caused by air pollution are estimated at 430,000
- CVD,Lung cancer,Dementia &Lung diseases,

# **Types and Sources of Air pollution**

- Primary and Secondary

# Primary air pollutants

1. CO<sub>2</sub> currently forms about **410 parts per million** (ppm) of earth's atmosphere, compared to about 280 ppm in pre-industrial times, and billions of metric tons of CO<sub>2</sub> are emitted annually by the burning of fossil fuels accelerating heading

# 2.SO<sub>x</sub>

**Coal and petroleum** contain sulfur compounds, and their combustion generates sulfur dioxide. Further oxidation of SO<sub>2</sub>, usually in the presence of a catalyst such as NO<sub>2</sub>, forms H<sub>2</sub>SO<sub>4</sub>, and thus **acid rain** is formed a subheading



**3. Nitrogen oxides**, particularly nitrogen dioxide, are expelled from high-temperature combustion and are also produced during thunderstorms by electric discharge.

# 4. Carbon monoxide

- Product of incomplete combustion
- nausea, vomiting, head ache etc.,

# 5. VOCs

# 6. Free Radicals

# 7.CFCs

Chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) are fully or partly halogenated paraffin hydrocarbons that contain only carbon (C), hydrogen (H), chlorine (Cl), and fluorine (F), produced as a volatile derivative of methane, ethane, and propane. They are also commonly known by the DuPont brand name **Freon**.

# 8. Ammonia

In the atmosphere, ammonia reacts with oxides of nitrogen and sulfur to form secondary particles

# **9. Radioactive pollutants**

is a by-product of various nuclear technology processes