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AIR POLLUTION & RESPIRATORY ILLNESS

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Abstract

The Oxford English Dictionary defines pollution as “the act of polluting”. “Pollute” means destroy the purity or sanctity; make foul or filthy. It is one of the gigantic crises of our environment today. It causes global warming, or the Green House Effect and the depletion of the Ozone layer, acid rain and so on.

Air pollution in cities has increased as more and more people have crowded into them. Rapid industrialization, urbanization, oil, fuel, oil and smelting industries, motor vehicles, and very big dust bins are emitting poison gases that affect human beings. Gaseous pollutants and particulate pollutants are affecting our world population.

Polluted air affects animals, plants, materials, the atmosphere and especially human beings. Carbon monoxide, Sulphur dioxide, Nitric oxide, Hydrogen sulphide, aldehydes and hydrocarbons cause many disease viz., reducing haemoglobin in the blood, temporary spasm of the smooth muscles of the bronchioles, cough, spasm of the larynx, irritating of the membranes of the eyes, ears and nose, pulmonary haemorrhage, lung cancer, brain damage, emphysema, abnormal births, impotency of males, etc.

Radioactive and thermal pollution has been used to identify the detrimental effects of heated charges. Cosmic rays are bombardment of the atmosphere. Tritium potassium 40, Rubidium 87 Radon-222, Uranium-238, thorium, polonium, plutonium, Alpha, Beta, Comma and X-rays and also nuclear explosions pollute the atmosphere.

On the basis of existing knowledge, considerable pollution of the atmosphere can be avoided without undue capital expenditure. Certain emissions from special processes; however, appear to be unavoidable with present techniques, and others can be reduced only at a great cost. Intensified research is needed to obtain more information on methods to significantly reduce the quantity of pollutants discharged from special processes.

INTRODUCTION:

Resources and Environment are polluted by human activities directly and indirectly. The Oxford English Dictionary defines “Pollute” and “Pollution” as follows:

POLLUTE: destroy the purity or sanctity make (water etc) foul or filthy

POLLUTION: the act of polluting

According to M.P. MISHRA

“Undesired changes in the natural quality of environmental components are called as Pollution”

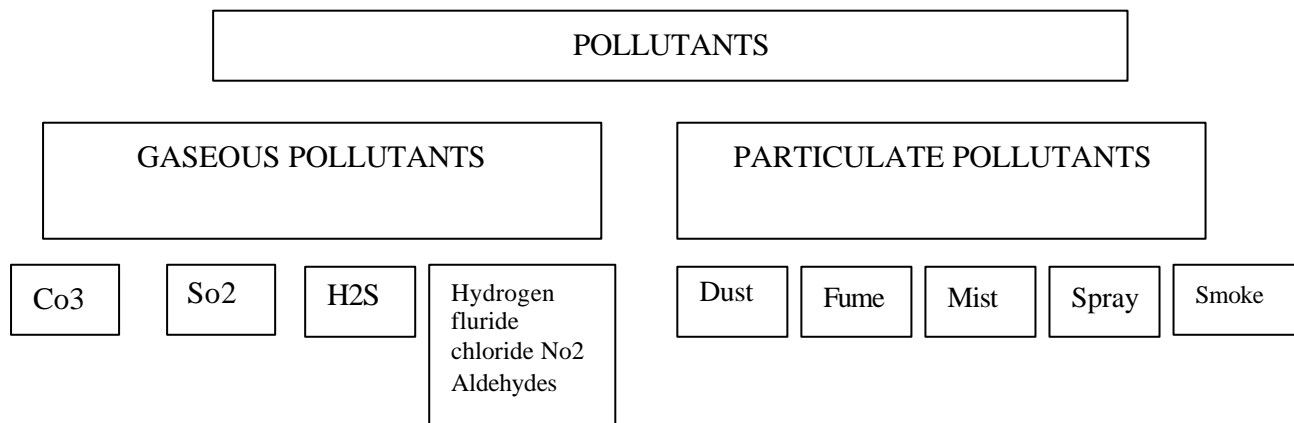
DIFFERENT TYPES OF POLLUTION:

Pollution can be divided into four types Viz.

- Air Pollution
- Water Pollution
- Land Pollution and
- Noise Pollution

AIR POLLUTION in cities has increased as more and more people have crowded into them. Rapid industrialization results in deterioration of the quality of air. Utilization of coal as a fuel and its incomplete combustion leads to emission of soot, sulphur and other compounds into the atmosphere.

When we breathe, not only oxygen, but also other gases and materials enter our respiratory system. Air pollution may be described as the imbalance in the quality of the air which causes ill effects.



Both of them polluted our air atmosphere.
A report by E.L.HALL indicates that

“ Internal Combustion engines and industrial furnaces may release up to 500ppm of oxides of N2. The oxides of nitrogen are the second most abundant atmospheric pollutants and are extremely affected to human health.”

DIAMETER OF THE POLLUTANT

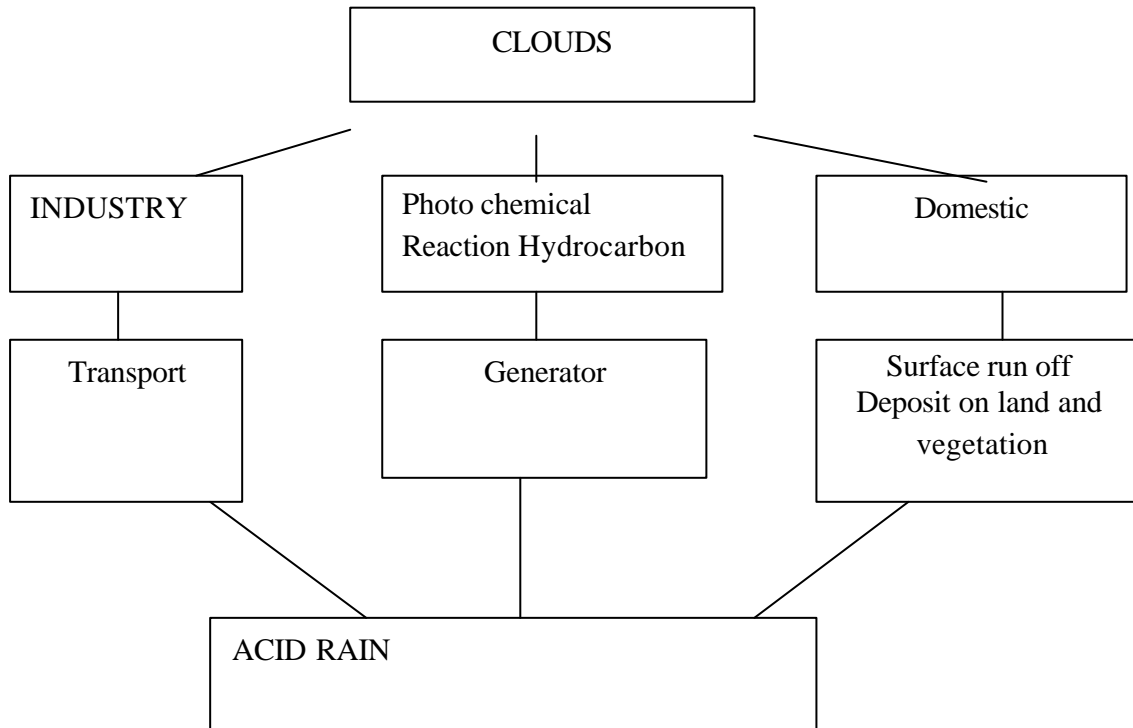
In microns

- 1000	}	DUST
-100		
-10		
- 1		
- 0.5		
-0.1	}	SMOKE
- 0.01		
- 0.001		
-0.0001	}	GASES
-0.00001		

Fine particles like Co^3 , Metallic dusts, tars, resins, aerosols, Rolidoxides nitrates and sulphates, coarser particles from the chimneys of thermal power stations and CFC's (chlorofluorocarbons) from pressurized aerosol cans and bottles. Automobiles, Electric power plants, metallurgical processes, refineries, pulp and paper mills, sugar, cotton and rubber plants, Heating plants, pesticides, insecticides and plant hormones. And also PAN- Peroxy Acylnitrate polluted our atmosphere.

ACID RAIN:

Pollutants suspended in air finally come down along with the rain water. So2 and No2 present in air get combined with rain water to produce acidic effects.



Acid rain water damages monuments, especially the world wonders “Tajmahal” in Delhi, burns plant leaves and poisons ground water.

THE FOLLOWING TABLE GIVES AN IDEA OF THE AMOUNT OF POLLUTANTS IN THE ATMOSPHERE / YEAR

Sl.No.	POLLUTANTS	AMOUNT / YEAR
1	CO ₂ - Carbondioxide	98000 million tonnes
2	Co- Carbonmonoxide	360 million tonnes
3	SO ₂ - Sulphurdioxide	36000 million tonnes
4	NO _x Nitrogenoxide	170 million tonnes
5	Particulate	190 million tonnes

CAUSES OF AIR POLLUTION

OCCUPATIONAL DISEASES

Name of Diseases	Occupation
Asbestosis	Cement industry
Byssinosis	Cotton mills
Silicosis	Silicon industry
Minamata	Mercury and glass industry

We cannot forget the tragic industrial calamity at Bhopal in December 1984. When the deadly gas (methyl isocyanate) from the chemical plant operated by Union Carbide escaped into the atmospheric killing over 4000 local residents and rendering blind and crippling a large section of the city’s surviving population.

- Mense valley of Belgium in 1930 in Donora
- Pennsylvania in USA in 1948
- London in 1952
- The Poza Rica in Mexico and LosAngels

RADIO ACTIVE POLLUTION:

According to H.P.JAMMET “radioactive pollution of the environment as the increase in natural background radiation emerging from the activities of man involving the use of naturally occurring or artificially produced radioactive materials”

NUCLEAR WEAPON TESTING:

Strontium - 80,90	Cerium 141, 144
Caesim – 137	Promethium 147
Iodine- 131,132, 133, 135	Somarium 151
Uranium – 235	Carbon 14
Plutonium – 239	Coblet 57,58,60
Ruthenium – 103, 106	

Alpha, Beta, Gamma and cosmic rays have numerous ill-effects such as metabolic changes and abnormal births, mutations in man and also cancer.

RESPIRATORY ILLNESS:

Air pollution has been detrimental to human health especially as it affects the respiratory system with both gaseous and particulate pollutants.

CO is an asphyxiant gas and when absorbed into the lungs, it combines with haemoglobin in the blood to form carboxyl haemoglobin, thus reducing the haemoglobin available to carry oxygen to the body. The affinity of CO to haemoglobin is 240 times greater than that of oxygen. Persons are suffering from anaemia, which is injurious of vital organs. Haemoglobin are saturated by CO.

SO₂ causes temporary spasm of the smooth muscles of the bronchioles. 'Desfumatation' or peeling off of the surface epithelium with mucosa also results at still higher concentration.

The cilia which protect the respiratory system are affected by SO₂

- Dry cough
- Shortness of breath
- Spasm of the larynx
- Eyes with tears and Redness
- Injures the muscosa as a nidus – (place for laying eggs by insects and small organism)
- Affect the nose
- Loss of memory
- Damage the lungs and lungs cancer
- Low concentrations of Ozone cause pulmonary ocdema and haemorrhage
- Hydrocarbons cause lung cancer
- Lead emitted from automobiles particularly affect children by brain damage
- Bronchitis, Emphysema – (enlargement of air vessels of the lungs) and Asthma
- The effects of particulate pollutants are affected nasal passages and also penetration of the lungs rapidly.
- Soluble and insoluble aerosols are carried to the lymphatic stream to be deposited in pulmonary lymphatic dept points or in the lymph glands.

PREVENTION & CONTROL : Pollution is not as simple as prevention of air pollution.

- Fuel Selection and utilisation
- Process changes or equipment
- Site selection and zoning
- Control of aerosol emissions – i.e. arresters and wet scrubbers
- Control of emission from motor vehicles (Tune-ups, Catalytic reactors and engine modification)
- Zoning is a control measure based upon the knowledge of mechanics of the atmosphere.

LEGAL CONTROLS:

- Technical and scientific knowledge alone is not sufficient in controlling air pollution. WHO administrative control of atmospheric pollution can be most effectively developed into appropriate laws at the national level through the formation of a committee representing public health administration, industrial hygiene, fuel usage, agriculture, science, industry and urban areas.

CONCLUSION:

On the basis of existing knowledge pollution of the atmosphere can be avoided without undue capital expenditure – certain emissions from special processes however appear to be unavoidable with present techniques and others can be reduced only at a great cost. Indemnified research is needed to obtain more information on methods of significantly reducing the quantity of pollutants being discharged from special processes.

Indian parliament made 2 important amendments in the constitution 42 in Article 48A, 51A 48A and especially 51A. It states “To protect and improve the environment and to safeguard the forest & wild life” of the country.

Air prevention and control of pollution Act 1981, 1988. If we cannot find remedies eventually human beings, even dogs, will have to wear mask to keep their heads free from air pollution.

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