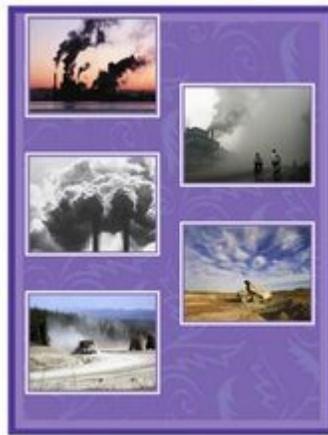


INDUSTRIAL DUST AND AIR POLLUTION

Introduction - Air pollution is the presence of high concentration of contamination, dust, smokes etc., in the general body of air man breaths. Dust is defined as particulate matter as “any airborne finely divided solid or liquid material with a diameter smaller than 100 micrometers.” Dust and smoke are the two major components of particulate matter. Car emissions, chemicals from factories, dust, pollen and mold spores may be suspended as particles. Ozone, a gas, is a major part of air pollution in cities. When ozone forms air pollution, it’s also called smog. These materials come from various sources, such as, various industrial processes, paved and unpaved roadways, construction and demolition sites, parking lots, storage piles, handling and transfer of materials, and open areas. Some air pollutants are poisonous. Inhaling them can increase the chances of health problems. In fact, dust when inhaled can increase breathing problems, damage lung tissue, and aggravate existing health problems. In addition to health concerns, dust generated from various activities can reduce visibility, resulting in accidents. Therefore, every federal Govt. has stringent regulations which require prevention, reduction and/or mitigation of dust emissions.



Thus, prime sources of air pollution are the industrial activities or processes releasing large quantity of pollutants in the atmosphere. These pollutants are mainly:

- (a) Smoke comes out from various industries like, power plants, chemical plants, other manufacturing facilities, motor vehicles, etc.;
- (b) Burning of wood, coal in furnaces and incinerators;
- (c) Gaseous pollutants from Oil refining industries;

(d) Dust generated and thrown to general atmosphere by various industries such as cement plants, ore / stone crushing units, mining industries due to rock drilling & movements of mining machineries & blasting etc.;

(e) Waste deposition for landfills which generate methane;

(f) Toxic / germ / noxious gasses and fumes generated from military activities and explosives blasting in mines.

2.0. Mechanism of Adverse Impact of Smoke Pollutant – The main sources of smoke pollutants in urban areas are Petrol / Diesel driven motor vehicles, Fuel combustion in stationary sources including residential, commercial and industrial heating / cooling system and coal-burning power plants etc.

Petrol / Diesel driven motor vehicles produce high levels of Carbon Dioxide (CO₂) / Carbon Monoxide (CO), major source of Hydrocarbon (HC) and Nitrogen oxides (NO_x). Fuel combustion in stationary sources is the dominant source of Carbon Dioxide (CO₂) and Sulfur Dioxide (SO₂).

Carbon Dioxide (CO₂) – This is one of the major gas pollutants in the atmosphere. Major sources of CO₂ are due to burning of fossil fuels and deforestation. Industrially developed countries like USA, Russia etc., account for more than 65% of CO₂ emission. Less developed countries with 80% of world's population responsible for about 35% of CO₂ emission. Due to high growth reported from less developed countries in last decade, it is estimated that, the Carbon dioxide emissions may rise from these areas and by 2020 their contribution may become 50%. It has also been seen that, Carbon dioxide emissions are rising by 4% annually.

As ocean water contain about 60 times more CO₂ than atmosphere; CO₂ released by the industry leads to disturbance of equilibrium of concentration of CO₂ in the system. In such a scenario, the oceans would absorb more and more CO₂ and atmosphere would also remain excess of CO₂. As water warms, ocean's ability to absorb CO₂ is reduced. CO₂ is a good transmitter of sunlight, but partially restricts infrared radiation going back from the earth into space. This produces the so-called "Greenhouse Effect" that prevents a drastic cooling of the Earth during the night. This so-called "Greenhouse Effect" is responsible for GLOBAL WARMING. Currently Carbon Dioxide is responsible for major portion of the global warming trend.

Nitrogen oxides (NO_x) – They come mainly from nitrogen based fertilizers, deforestation, and biomass burning. Nitrogen oxides contribute mostly as atmospheric contaminants. These gases are responsible in

the formation of both acid precipitation and photochemical smog and causes nitrogen loading. These gases have a role in reducing stratospheric ozone.

Sulfur Dioxide (SO₂) – Sulfur dioxide is produced by combustion of sulfur-containing fuels, such as coal and fuel oils. SO₂ also produced in the process of producing Sulfuric Acid and in metallurgical process involving ores that contain sulfur. Sulfur oxides can injure man, plants and materials. As emissions of sulfur dioxide and nitric oxide from stationary sources are transported long distances by winds, they form secondary pollutants such as nitrogen dioxide, nitric acid vapor, and droplets containing solutions of sulfuric acid, sulfate, and nitrate salts. These chemicals descend to the earth's surface in wet form as rain or snow and in dry form as a gases fog, dew, or solid particles. This is known as acid deposition or acid rain.

Cholorofluorocarbons (CFCs) – Chlorofluorocarbons, also known as Freons, are greenhouse gases that contribute to global warming. CFCs are responsible for lowering the average concentration of ozone in the stratosphere.

Smog – Smog is the result from the irradiation by sunlight of hydrocarbons caused primarily by unburned gasoline emitted by automobiles and other combustion sources. Smog is created by burning coal and heavy oil that contain mostly sulfur impurities.

Source : <http://saferenvironment.wordpress.com/2009/09/05/industrial-dust-air-pollution-and-related-occupational-diseases/>