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METHODS CONTROLLING THE EFFECTS OF GLOBAL WARMING

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ABSTRACT

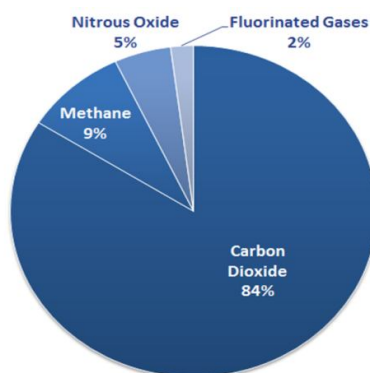
Now-a-days Global warming is a major problem on Earth. The level of carbon dioxide, methane, nitrous oxides, are increasing because of burning fossil fuels or deforestation. Greenhouse gases are responsible for global warming. It has various effects on human health. Nanomaterials acts as good adsorbent due to extraordinary properties. There is no chemical bond found between adsorbent and adsorbate, only van der waals interaction found.



KEYWORDS : global warming , extraordinary properties , human health.

INTRODUCTION:

Global Warming is the increase of Earth's average surface temperature due to effect of greenhouse gases, such as carbon dioxide emissions from burning fossil fuels or from deforestation. Greenhouse gases are nitrous oxides, methane, carbon dioxide, fluorinated gases etc.



The Intergovernmental Panel on Climate Change (IPCC) reported in 2017 that 95% of global warming is being caused mostly by increasing concentrations of greenhouse gases and other human (anthropogenic) activities.

FACTORS RESPONSIBLE FOR GLOBAL WARMING:

Deforestation: Because of deforestation the amount of CO₂ is rapidly increasing in the environment. The equilibrium between oxygen and carbon-dioxide has been disturbed. Excessive use of fossil fuels: Due to

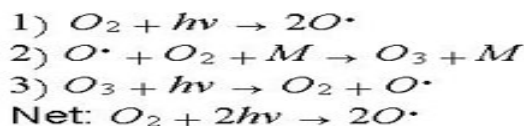
excessive use of coal, petroleum and petroleum gas the level of carbon-dioxide is increasing. Less use of renewable energy resources, excessive use of pesticides and fertilizers, industrial revolution, lack of waste treatment plants, burning of agricultural remains.

FACTORS CAUSING OZONE DEPLETION:

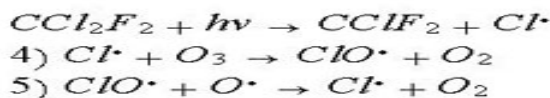
Harmful gases emitted by ACs, refrigerators, industries and vehicles are depleting Ozone layer & increasing our exposure to very harmful UV rays of sun resulting in various skin diseases, eye cataract & even cancer. Wastes like plastics and other nondegradable wastes like insecticides, pesticides, chemical fertilizers etc.

MECHANISM OF OZONE DEPLETION:

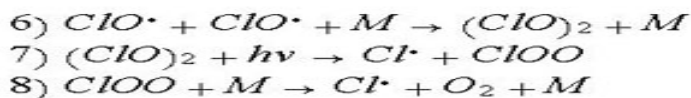
Chapman Cycle



CFCs - Catalytic Cycle I



Cl[•] - Catalytic Cycle II



In ozone depletion ozone is converted into oxygen due to free radicals formed by irradiation of CFCs and other chemical substances. These free radicals react with ozone and break it up into oxygen molecule and oxygen free radical. The oxygen free radical reacts with another free radical and produce another free radical and this process continues.

PROTECTION OF OZONE LAYER

Check your fire extinguishers to find active ingredients. If halogenated hydrocarbon is the main ingredient, find a hazardous waste center at which to recycle it or call your local fire department for instructions on how to dispose of it. Replace it with a model without this harmful ozone-depleting chemical. Don't buy aerosol products with chlorofluorocarbons (CFC). Although CFCs have been banned or reduced in many applications, the only way to be sure is to check the label on all your hairsprays, deodorants and household chemicals. Opt for pump spray products over pressurized cans, to further reduce your chance of buying CFCs. Dispose of pre-1995 refrigerators, freezers, and air conditioning units properly. These devices use chlorofluorocarbons to function, so leaks release the chemical into the atmosphere. Buy lumber, wood products and plywood that were not treated with methyl bromide. Wood treated with this pesticide will "off gas" elemental bromine that depletes the ozone layer. Changing the habits of daily life also helpful in protection of ozone layer such as drive less, use public transport etc.

Most affected areas from global warming around the world are Bangladesh, Australia, Sudan, Islands etc. Due to global warming polar ice caps are melting. If ice melts with this rate earth will be glaciers free by

2070. Current rates of sea-level rise are expected to increase as a result both of thermal expansion of the oceans and melting of most mountain glaciers and partial melting of the West Antarctic and Greenland ice caps. Consequences include loss of coastal wetlands and barrier islands, and a greater risk of flooding in coastal communities. Low-lying areas, such as the coastal region along the Gulf of Mexico and estuaries like the Chesapeake Bay, are especially vulnerable. The latest Intergovernmental Panel on Climate Change report found that approximately 20 to 30 percent of plant and animal species assessed so far are likely to be at increased risk of extinction if global average temperature increases by more than 2.7 to 4.5 degrees Fahrenheit. The ocean will continue to become more acidic due to carbon dioxide emissions. Because of this acidification, species with hard calcium carbonate shells are vulnerable, as are coral reefs, which are vital to ocean ecosystems. It is predicted that a 3.6-degree Fahrenheit increase in temperature would wipe out 97 percent of the world's coral reefs.

Warming temperatures, alternating periods of drought and deluges, and ecosystem disruption have contributed to more widespread outbreaks of infections like malaria, dengue fever, tick-borne encephalitis, and diarrheal illnesses. People living in poverty will be hardest hit by the global surge in infectious diseases. Global warming could increase smog pollution in some areas and intensify pollen allergies and asthma. Hotter conditions could also aggravate local air quality problems. Hurricanes and other storms are likely to become stronger. Species that depend on one another may become out of sync. For example, plants could bloom earlier than their pollinating insects become active. Floods and droughts will become more common. Rainfall in Ethiopia, where droughts are already common, could decline by 10 percent over the next 50 years. Less fresh water will be available. If the Quelccaya ice cap in Peru continues to melt at its current rate, it will be gone by 2100, leaving thousands of people who rely on it for drinking water and electricity without a source of either. Ecosystems will change—some species will move farther north or become more successful; others won't be able to move and could become extinct. Wildlife research scientist Martyn Obbard has found that since the mid-1980s, with less ice on which to live and fish for food, polar bears have gotten considerably skinnier. Polar bear biologist Ian Stirling has found a similar pattern in Hudson Bay. He fears that if sea ice disappears, the polar bears will as well. To check the problems of climate change and global warming various efforts have been made by the coalition of developed and developing countries. The Kyoto protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets. Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities." The Lima Climate Conference achieved a range of important outcomes and decisions and "firsts" in the history of the international climate process. Pledges were made by both developed and developing countries prior to and during the COP (conference of the parties) that took the capitalization of the new Green Climate Fund (GCF) past an initial \$10 billion target. Levels of transparency and confidence-building reached new heights as several industrialized countries submitted themselves to questioning about their emissions targets under a new process called a Multilateral Assessment. The Lima Ministerial Declaration on Education and Awareness-raising calls on governments to put climate change into school curricula and climate awareness into national development plans. The developed and developing countries will meet in Izmir (Turkey) in June 2018 to discuss the carbon emission and use of green and energy efficient technologies.

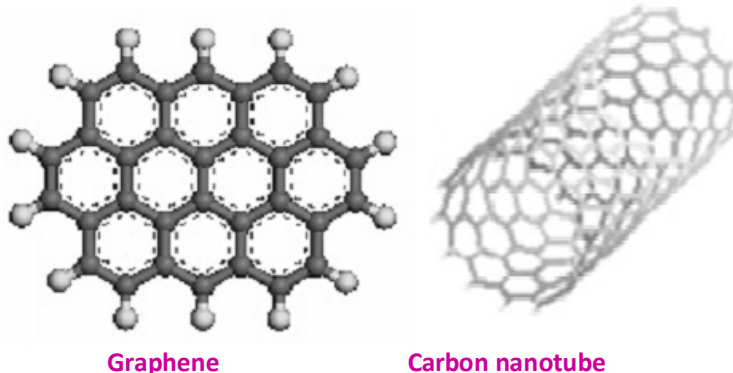
EFFECT ON HUMAN HEALTH

Global warming has various effects on human health. The effect of global warming depends on the complex interaction between the human host population and the causative infectious agent. The main indirect effects are on infectious diseases. Even though the effects on infectious diseases will be detected worldwide, the degree and types of the effect are different, depending on the location of the respective countries and socioeconomical situations. Even with the strongest mitigation measures, global warming

cannot be avoided for decades. implementation of adaptation procedures to the global warming is the most practical action we can take. There are multiple adaptation measures to the effect on infectious diseases. These include (1) vector control, (2) development of vaccines and implementation of vaccination, (3) development of new drugs, (4) establishment of surveillance and control programs.

RESULT AND DISCUSSION

The interaction of greenhouse gases such as carbon dioxide, methane, nitrous oxides and fluorinated gases with adsorbent plays a vital role in minimizing the greenhouse gases in environment which are responsible for global warming. Nanomaterials surfaces act as good adsorbent because of high surface area, porous structure etc. The nanostructures of metal oxides like MgO, TiO₂ etc. play an important role for adsorption of greenhouse gases. The allotrope of carbon such as graphite, graphene and nanotubes (multi-walled nanotubes, single-walled nanotubes) also have characteristics of good adsorbent surfaces. Carbon nanotube is a cylindrical type nanostructure. It consists extraordinary thermal conductivity, mechanical strength and electrical properties. Because of these extraordinary properties the CNT are at least 100 times stronger than steel, but only one-sixth as heavy. It is also found as additive to other structural materials. Carbon nanotubes can conduct heat and electricity far better than copper. Mainly nanotubes are of two types one is single-walled carbon nanotubes (SWCNTs) and other is multi-walled carbon nanotubes (MWCNTs). Generally single-walled nanotubes have a diameter of one nanometer. Its structure can be abstracted by wrapping layer of graphene into a cylinder. Graphene and graphite are sp² hybridized. Its high surface area is because of its porous structure. These contain high thermal and electrical properties. It is cheap, low weight, easily to modify. Graphene surface can be modified by creating vacancy, by doping metal and cluster of metal. The structure graphene and carbon nanotubes are shown in figure.



After the optimization of graphene surfaces and carbon nanotube, we optimized the greenhouse gases (carbon monoxide, nitrous oxides, methane). Here greenhouse gases act as adsorbate and graphene and carbon Nanotubes surfaces act as adsorbent. We found only physical adsorption take place between gases and surfaces. The binding energy of gases on both surfaces varies from -0.03 eV to 0.01 eV. No chemical bond formed between adsorbent (pristine graphene, nanotubes surfaces) and greenhouse gases.

CONCLUSION

Greenhouse gases are responsible for global warming. Excessive use of fossil fuels increases the level of greenhouse gases in environment. Polar ice caps are melting because of global warming. Global warming has various effects on human health. The main indirect effects are on infectious diseases. Metals oxides, carbon nanotubes and graphene surfaces are used for interaction with greenhouse gases. It is clear from binding energy that these surfaces show only physical adsorption.

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