

# Chemistry: pollution or a double-edged sword? assignment



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Chemistry is one of the most important branches of scientific study to the human race, as the results of its understanding have made most of what entails modern life possible. Without a thorough understanding of chemical properties and processes, most of what people take for granted on a daily basis, such as cars, electronics and even plastics, would not exist. Chemistry concepts and research are directly responsible for the medical breakthroughs and the medicines that prolong life-spans and combat common, though potentially debilitating, health conditions.

Chemistry encompasses and incorporates many other principles as well, ranging from physical properties to electrostatic forces, branching into nearly every discipline and profession to some extent. One of the most common, yet overlooked, principles of chemistry in daily life is the modern building materials and the structures that are made from them. As far back as the ancient Egyptians and the Roman Empire, chemical properties were studied and refined to produce concrete, one of the most useful and prolific building materials mankind has ever employed.

Simple concepts, such as electrical power and even the principles of heat and pressure all have their roots in chemistry. Chemists contribute to hundreds of different technologies. Here are a few: computers, fuels, engines, etc. Engines benefit from alloys that allow for lighter engines with higher compression. Computers with purer silicon allow for smaller microprocessors. Chemical processes and their origins have helped the human race understand itself, the world around it and the greater universe as a whole, leading to nearly every technological advance seen today.

Pollution is the introduction of contaminants into the natural environment that cause adverse change. Pollution can take the form of chemical substances or energy, such as noise, heat or light. Pollutants, the components of pollution, can be either foreign substances/energies or naturally occurring contaminants. Chemical pollution damages the environment and poses both short-term and long-term health dangers to human beings. Chemical pollution occurs when chemicals resulting from human activities enter the environment, contaminating air, water or soil. Acid rain, greenhouse gases and ozone are all examples of chemical pollution.

The various ways through which chemical pollution is caused and their adverse effects have been discussed below: 1 . From Industrial Wastes When industrial wastes containing poisonous chemicals are dumped carelessly, they contaminate vegetation, surface water as well as ground water supplies. Later on, these chemicals find way into all those organisms that eat the plants or grass or drink water contaminated with these chemicals. Some of the large variety of ground on large scale are: acids , bases, salts, metal solutions, oils grease, dyes , waste solvents, poisons such as cyanide's and mercury and variety of other chemicals.

Heavy metals such as lead, mercury, manganese, cadmium and chromium are generally toxic to life forms in greater than trace amounts. In many countries, various surface water bodies have already been heavily contaminated with poisonous chemicals posing a serious danger to aquatic life. Fishes living in several highly polluted water bodies such as rivers, lakes and along sea shores where untreated chemical effluents are released are

found to be so contaminated with poisonous chemicals that they are considered find way in their bodies and cause many disease.

In some cases, fishes are even found dead due to the presence of high concentration of chemicals in water. 2. Accidents in Chemical Factories Sometimes-chemical pollution caused by the accidental release of some toxic Heimlich; in the factory. Such accident took place in the Union Carbide Plant at Opal in December 1984. In this incidence, highly toxic Methyl Consonance (MIMIC) gas leaked from the plant. This resulted in the death of thousands of people and animals in the surrounding localities. Many more suffered from different types of ailments.

The exact impact of the chemical on the health of future generations cannot be assessed. 3. Excessive Use of Fertilizers The excessive use of chemical fertilizers to boost the production also leads to contamination of various water bodies. Contamination of water with fertilizers leads to very undesirable effects such as eutrophication. This is due to the reason that phosphate and nitrate encourage the growth of algae, which depletes the water body of its oxygen content. As a result, fishes and other aquatic life forms are adversely affected.

Moreover, it is well established that nitrate in sufficient concentration is toxic to higher organisms including human beings. 4. Use of Pesticides The use of pesticides has also increased enormously in the recent past. These pesticides find their way into lakes and rivers and contaminate them. Most of these chemicals are toxic in nature. These chemicals get progressively concentrated in the food chain. These chemicals can cause long-term

damage to the health of human beings. These pesticides find also enter our bodies directly if the food articles to which these chemicals are sticking are not thoroughly washed before consuming.

EDT and other chlorinated hydrocarbons, which have long been used as pesticides, have been found to be toxic. EDT is a highly stable compound. It is not easily metabolites (broken down) by animals. It is deposited and stored in the fatty tissues. Chemical within the animals, soil and water over a period. Investigations have revealed that people living in some of the urban areas of our country have alarming amounts of EDT in their bodies. EDT and other non-biodegradable pesticides are now being replaced with biodegradable pesticides. . Release of Gaseous Pollutants in Air Many industries release large number of pollutants in the atmosphere. These pollutants are responsible for variety of diseases. Persons exposed to CO, CA, SIS, hydrocarbons and particulate matter suffer from headache, dizziness, irritation of the eyes and nose, allergies, chest pain and many respiratory disorders. 6. Pollution Caused by Dust Certain industries give rise to considerable amounts of dust. Workers exposed to various types of injurious dusts suffer from a number of ailments.

Following special Pneumonia's is caused by inhalation of coal dust. Workers in coal, mines suffer from this disease. Silicosis is caused by stone (silica) dust. Workers in stone quarries or those engaged in the cutting and grinding of stone from this disease. Asbestosis is caused by asbestos dust. Workers involved in the manufacture of Bedside and cigarettes may suffer from this disease. Siderites is caused by iron dust. Workers involved in carpet weaving generally suffer from disorders such as asthma and tuberculosis..

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The persons exposed to smoke and other gaseous pollutants are also more prone to lung disorders and infections. The pursuit of knowledge carried on by scientists for the past several centuries has produced results over which opinion is sharply divided. Science, originally intended to conquer and harness the forces of nature for the good of man, is looked upon by some as the chief cause of the suffering of humanity today. On the other hand, there are a good many people who consider science to be the harbinger of all progress, rookeries and comfort.

The controversy has been raging for a long time, though science goes on taking long strides . Obviously regardless of the conflicting opinions pronounced on its achievements. Leaders of thought, be they scientists or not, however, occasionally pause and ponder whether science is going the right way and really promoting human welfare. A dispassionate and comprehensive survey of the fruits of scientific advance in the various spheres of human life provides sufficient ground to be skeptical about the claim that science is an unqualified and unmixed blessing to humanity.

They have reason to conclude that all is not well with science and its application. Pure science is a relentless search for truth, for the discovery of the laws of nature. As such, no fault finding is possible with pure scientific research. The position, however, changes materially in regard to the application of scientific research in the field of practical activity. Science is like a sharp sword which can be What the pure scientist gives to his fellow-beings may thus be turned to their advantage, or exploited for subversive and destructive purposes.

The application of science, therefore, depends upon the Just or unjust aims man has in view, and the history of the world shows that the application of science has not always been governed by principles of Justice and consideration of the general good of the people. Therefore in my opinion, chemistry is a double edged sword as with all the benefits and the advancement that we have derived out of it and at the same time the ill effects that it can have and the potential dangers that it poses if misused. So it is really very necessary that it is handled with utmost care. Because with great powers comes great responsibilities.