

Harmful Effects of Plastics on Health and Environment

Definition of Plastic:

Plastic is an organic material manufactured from petroleum derivatives. It is composed of one organic substance or more. It can be shaped into any form or shape as desired.



Characteristics of plastic:

1. Manufacturing or burning of plastics cause emissions of toxic gases and release a toxic carcinogen called dioxin. The dioxin affects the function of the reproductive and immune system. It also causes hormonal disruption and growth problems. It has the ability to accumulate in the food chain and stay for long periods of time in the environment. It poses serious danger even when it is in small quantities.
2. Electrical and thermal insulator.
3. Resistant to penetration of water and gases.
4. Lightweight.
5. Non-biodegradable and takes hundreds of years to break down.
6. Flammable.

Harmful effects of plastic bags on health and environment

1. Using plastic bags in packaging of hot bread and meals makes these bags flexible and able to interact with high heat resulting in release of the carcinogenic dioxin.
2. The light weight and high consumption of plastic bags and their ability to persist for long periods of time in the environment without decomposing made them one of the main factors of pollution in the open spaces, public squares, main roads inside and outside cities, sea beaches and water.
3. The easy evaporation and wide use of plastic bags make it difficult to collect and dispose them. They also distort the general appearance of the places where they are.
4. When plastic bags stick to trees and plants they obstruct the natural light from reaching parts of the plant causing impairment to the process of photosynthesis.
5. Plastic bags cause diseases and even death to the cattle that come across and eat them during pasture.
6. Burying of plastic bags in soil makes an insulating layer that keeps rainwater in the upper part of the soil and prevents water and other fertilizers from reaching its lower part.
7. Plastic bags create a fertile environment for the growth of infectious bacteria because of their ability to float on the surface of water for long periods.
8. Accumulation of plastic bags in water blocks the irrigation canals and drainage



networks.

9. Burning of plastic bags causes the emission of chlorinated dioxin, carbon dioxide, dioxin, other gaseous compounds, acids and many harmful toxic compounds.
10. Plastic bags pose danger to the environment and marine organisms when they exist and pile up in the coastal areas.
11. Using plastic containers to save food especially pickles, acid and fatty food causes plastic to decompose, and toxic carcinogens to access the body.

Warnings:

1. Do not use any plastic containers or utensils in the microwave.
2. Do not use plastic bottles to keep water in the refrigerator.
3. Do not put food wrapped with plastic in the microwave.
4. Be aware that the indiscriminate burning of plastic bags produces carcinogenic dioxin.
5. Do not use plastic containers to save food especially pickle, acid and fatty food because such practice causes plastic to decompose, and toxic carcinogens to enter the body.



Tips to curb the wide use of plastics:

1. Use paper or cloth bags instead of plastic bags.
2. Reuse plastic bags for many times to reduce consumption, and hence curbing the production of them.
3. Use glass containers such as Pyrex.
4. Use of plastic bags can be reduced through codification by imposing heavy taxes or fees on the production of them.
5. Compliance with proper criteria and standards on the production of plastic bags makes the bags thicker, more durable and biodegradable.
6. Reduce the use of plastic-wrapped products.
7. Mothers should be cautious not to use plastic bottles for feeding their babies.
8. Do not buy plastic toys which children can chew, and replace them with toys made of natural materials.
9. Do not buy or use plastic cups, plates or spoons, especially the disposable single-use ones.
10. If you select between different plastic products, choose the product that can be reused or recycled.
11. Do not take more plastic bags than you need when shopping.
12. In case you buy a product in a plastic can or bottle, reuse it for other purposes instead of disposal.
13. Avoid using plastic cups made of rigid polystyrene in drinking tea, coffee and other hot drinks. Use paper or glass cups instead.



Rules of recycle code:

1. Compliant with local laws.
2. Indicates only the type of plastic material.
3. Clear and does not affect the customer's purchase decision.
4. Unchangeable.
5. Not attached with any claims other than the one, near the code, declaring that the material is recyclable.
6. Must be printed on all cans from 8 ounces to 5 gallons.
7. Should be placed on the bottom of the can or bottle near the centre.



The triangle, in the recycle code of plastic, indicates that the plastic material is recyclable, and each number inside the triangle indicates a specific type of plastic as follows:

1. Polyethylene terephthalate: Safe and recyclable, plastic bottles and containers made of it used for water, juice, soft drinks and peanut butter packaging.
2. High-density polyethylene: Safe and recyclable, used for the manufacturing of packages for shampoo, detergents and milk, as well as plastic toys. It is safer than any other plastic material especially the transparent type.
3. Polyvinyl chloride: Harmful and toxic if used for long time. It is commonly abbreviated PVC and used in the manufacturing of plumbing pipes, bathroom curtains, toys, and transparent plastic wraps for meat and cheese. It is widely used because of its cheap price, so it is considered the most dangerous type of plastic.
4. Low-density polyethylene: Proportionally safe, recyclable, used for the manufacture of CDs, bottles and grocery bags.
5. Polypropylene: One of the best and safest types of plastic, suitable for cold and hot liquids and other products, unarmful, used in manufacturing of food containers, plates, medicine bottles and all food-related products. It is recommended that all food containers should be made of this substance, especially children's food containers used for school meal packaging, and water bottles reused for multiple times. Using disposable plastic for more than one time turns them toxic if refilled again.
6. Polystyrene: Dangerous and unsafe, used for burger, hotdog and teacups packaging. It looks like the cork and was being used in the international fast food chains in our region until recently, although the USA has prohibited the use of it for 20 years. MacDonal'd's also has stopped using it since 1980, so let us be cautious of this material that is still being used here in fast food and popular restaurants. This material has impact on the ozone layer because it is made of harmful Chloro Fluoro Carbon gas (CFC).
7. Others: Such material does not come under any category of the above-mentioned types of plastic. It can be mixture or compound of the six



PETE



HDPE



V



LDPE



PP



PS



OTHER

previous types. It is a source of debate among the scientific community as many international companies started to produce toys and baby-feeding bottles made of it.

Conclusion:

It is recommended that this material should be avoided as far as possible unless the material is transparent and there is a note on the bottle says: "BPA free bottles."

Biodegradable plastic:

Although traditional plastics can be reused or recycled, they take many decades and even more than two hundred years to decompose, leading to serious environmental problems.

The solution for this problem is to produce oxo-biodegradable plastics (oxo-bio) by using the degradable to water (D2W) additive during the standard production process of plastics. The impact of the additive is therefore negligible and there is no special training required for workers. There is no change involved to the standard plastics manufacturing processes and no impact on line speeds either during manufacture or in use.

D2wTechnology:

D2w converts plastic into a material with a completely different molecular structure by reducing the molecular weight of it so that it can be broken down and biodegraded to nothing more than CO₂, water and humus. It does not leave harmful material or methane. The oxo-bio does not require an environment with high level of bacteria or fungi to break down, as the degradation can take place on the ground in the open air or at sea under the sunlight. It can also be broken down in the dark - whether in hot or cold temperature.

The Oxo-bio Plastic is recyclable and can be used and reused without affecting its strength. Therefore, the oxo-bio plastic are better than the hydro-biodegradable plastics, that are degradable in water, such as the starch-based plastics which need a high-microbial environment to degrade.

Given the fact that methane is a greenhouse gas and is 23 times more harmful than CO₂, the oxo-bio plastics do not emit methane even during the lack of oxygen (this is in contrary to the hydro-biodegradable plastics, paper, cotton etc...).