

Recycled plastic waste and convert into the primary components from which it is made (A Review)

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Abstract: There is one synthetic substance that you can find everywhere, from the land and air to the deepest ocean trenches. This material is so durable that the vast majority of it still remains in our ecosystem. This substance found its way into the food chain, penetrated our bodies and reached our tissues, and finally it was discovered that it reached the human placenta. This material is plastic, which is widely used because of its high durability. The cables stretching across ocean floors, underground water pipes, and food packages that keep food fresh all depend on this substance. But it is known that it is difficult to recycle plastic efficiently using traditional methods, a study indicated that only nine percent of plastic waste is recycled to obtain new products. As well as ways to convert plastic into the primary components from which it is made.

Keywords: Recycling, Plastic waste, Environmental pollution

1- INTRODUCTION

It is the process of recycling and reusing waste, whether domestic, industrial or agricultural, in order to reduce the impact of these wastes and their accumulation on the environment. This process is done by classifying and separating the waste on the basis of the raw materials in it and then re-manufacturing each material separately(1).

The idea of recycling began during the First and Second World Wars, when countries were suffering from a severe shortage of some basic materials such as rubber, which prompted them to collect these materials from waste for reuse. After years, the recycling process has become one of the most important methods of waste disposal management. This is due to the many environmental benefits of this process(2).

For many years, direct recycling by producers of waste materials (scrap) was the main form of recycling, but with the beginning of the nineties, the focus began on indirect recycling, that is, manufacturing waste materials to produce other

products based on the same raw material, such as: recycling glass, paper, plastic, aluminum and others. The material is now being recycled. Industrialists have found that if recycling programs are taken seriously, they can help reduce the cost of raw materials and operating costs, and improve their image as permanent environmental polluters(3).

Despite the belief of some that waste recycling is the pinnacle of civilization, after ten years of implementing the idea, many people in countries that widely implement recycling began to question the effectiveness of that process, and is it the best way to get rid of waste? They discovered with time that the cost of remanufacturing is high in comparison to its advantages and returns(4).

The recycled product is usually lower in quality than the primary product used for the first time, and it is not used for the same purposes as the primary product. Despite this, the cost of manufacturing it is higher than the cost of manufacturing the primary product from its raw materials, which makes the recycling process economically irrational and even a waste of energy. So there is a bewildered question! If recycling is an ineffective way to dispose of waste, what is the best way to dispose of it, the only answer is in the hands of scientists, as they must search for another method to dispose of waste and at the same time not waste the non-renewable raw materials contained therein(5).

Some ideas have already begun to emerge, such as using crushed glass in the waste as an alternative to sand in paving streets, or trying to use waste to generate clean energy. In the future, we are waiting for many other ideas to get rid of waste piles in a way that preserves the environment and does not waste energy (6).

Since then, the cries of environmental defenders have risen, and green parties have appeared in many countries, and many have formed environmental awareness and a real desire to stop the drain of resources. The call for Earth Day was in 1970 (7). A generation emerged that knew new vocabulary such as: the ecological system, global warming, the effect of the green house, the ozone hole, recycling of waste and many attached to this last expression in a desire to atone for guilt for our poor planet.

In this topic, we will try to shed light on the techniques of recycling plastic waste (8).

Recycling plastic waste

Plastic is divided into many types that can be shortened into two main types: Hard Plastic and Thin Film Plastic.

– Before recycling, the plastic is washed with caustic soda added to it with hot water.

After that, the dry plastic is broken down and reused to make clothespins, hangers, and plastic electrical hoses.

It is not recommended to use plastic waste in the production of products that interact with foodstuffs, while plastic bags are recrystallized in crystallization machines.

The plastic recycling industry is described as a secured investment; Because the demand for it is increasing day by day, as it is included in most industries, and is suitable for all economic levels; Anyone can invest in it, whether small or large

the size of his money.. It is the recycling of plastic on which thousands of small and medium enterprises were founded in the Arab countries.

Plastic recycling depends on household and commercial waste, in which the percentage of plastic waste reaches approximately 10%, but it differs in its characteristics and economic and commercial value according to the society from which it comes out, as well as plastic and the extent to which it can be used again.

The plastic recycling process presents many investment opportunities for individuals, especially those with small and medium savings according (9, 10).

Rotation steps: Waste sorting: It is the most important stage in plastic recycling, as obtaining good quality plastic requires good sorting of household and commercial waste; Because plastic loses its properties in the event of impurities from other types of plastic, and sorting requires large labor, which creates many job opportunities.

Plastic waste is collected and sorted in many ways, including: it is collected in homes, shops and hotels and sold to the nearest scrap shop, or to scrap buyers roaming the streets, or collected by scavengers in landfills.

Washing: The plastic is washed with caustic soda, or concentrated liquid soap, in addition to hot water, as recycling requires that the plastic material be free of fats, oils and foreign bodies.

Plastic crushing: Plastic is broken if it is of a hard type in a crushing machine, by passing the plastic waste between the fixed rotating arms to be grinded, and the crushing size is controlled by a wire with specific slots to determine the size of the pieces (granules) produced.

Beading: The granules are re-washed due to their high economic value, to be placed in a beading machine that converts plastic pieces into granules (beads) to become a “raw material” that can be used to make new plastic products.

Forming : The plastic is formed in several ways according to the desired product, such as:Injection method: by using the spiral injector, which is a device consisting of a melting furnace, to recycle plastic waste as a first stage, then the injector puts the plastic molten through a mold to obtain the desired shape.

Inflating method: It produces hollow plastic products, such as football.

Cable method: The production of plastic products such as hoses, and power cables.

Cooling: This is done by passing the product over a basin of water.

4-COCLUSION

We must remember that plastic bags and other plastic products dumped in the ocean kill 1,000,000 marine creatures annually. Recycling plastic provides twice the energy needed to burn it in waste incinerators. Plastic takes 100 to 400 years to break down in a landfill.

We use more than 20 times more plastic today than we used to consume 50 years ago. Water bottles 90% of the value of their cost, we pay for the bottle, cover and brand.

It takes 1,000 years for plastic bottles to decompose when they are buried. There is also a very important thing that we often see these symbols on plastic boxes, and everything is made of plastic, each symbol has a meaning and includes The triangle means recyclable and recyclable, and each number inside the triangle represents a specific plastic material. And the letters are an abbreviation of the plastic name synonymous with the number in the triangle.

Number 1: Safe and recyclable, use for water, juice, soda and peanut butter cans.

Number 2: Safe and recyclable: It is used for cans of shampoo, detergents, milk and toys, and it is considered one of the safest types of plastic, especially transparent ones.

Number 3: Harmful and poisonous if used for a long time. It is called vinyl or PVC. It is used in plumbing pipes and bathroom curtains, and it is often used in children's toys and covering meat and cheese as a transparent plastic, so beware of this particular type because it is one of the most dangerous and cheapest types of plastic, so it is used frequently

Number 4: Relatively safe and recyclable, used to make cylinders, some bottles and shopping bags.

Number 5: One of the best and safest types of plastic, suitable for cold and hot liquids and materials, and is never harmful. It is used in the manufacture of food containers, dishes, medicine boxes and everything related to food.

We must make sure that all utensils are made of this plastic, especially the children's lunch boxes used for the school meal and the water bottle used more than once. And beware of using health water bottles more than once because they are made for one use only and become toxic if refilled.

Number 6: Dangerous and unsafe, which is called polystyrene or Styrofoam, cans of burgers, hot dogs, and cups of tea that look like cork and have been used until recently in our international fast food restaurants, knowing that it was banned more than 20 years ago in America by the government, it must Beware of this substance, which is still used in restaurants and popular buffets, and this substance is also considered one of the reasons for the lack of the ozone layer because it is manufactured using harmful CFC gas.

Number 7: This type does not fall under any of the previous six types, and it may be a mixture of them, and the important thing here is that many international companies have begun to avoid it, including the American company TOYS R US for toys, which also manufactures baby bottles. community.

Avoid this substance as much as possible unless it is labeled BPA-free, labeled BPA-free bottles, and is transparent.

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