
Future Roads (Using Plastic For Making Durable Roads)

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ABSTRACT

Plastic has slowly become an integral part of all human requirements. Plastic bags, packaging materials, bottles, cups and various other items have slowly replaced everything made of other material due to the advantage of plastic. Plastic is durable, easy to produce, lightweight, unbreakable, odourless and chemical resistant.

Plastic garbage is commonly seen around the country and has started causing several problems. Plastic waste clogs drains, causing floods. It chokes animals that eat plastic bags, etc. Plastic found in fields blocks germination and prevent rainwater absorption.

Recycling plastic can be done only 3-4 times and melting the plastic for recycling releases highly toxic fumes.

This report introduces a scientific, efficient and beneficial way to tackle this problem to use the non-biodegradable plastic waste and plastic polythene for constructing the roads. Using plastics to construct the roads is efficient, economical and environmental friendly.

Keywords— plastic waste management, Mixing of tar with plastic along with casein, non-biodegradable

I. INTRODUCTION

Plastic pollution involves the accumulation of plastic products in the environment that adversely affects wildlife. Wildlife habitat or humans. Plastic pollution can unfavorably affect lands, waterways and oceans. Living organism's particularly marine animals can also be affected through entanglement, direct ingestion of plastic waste or through exposure to chemicals within plastic that cause interruption in biological functions. Humans are also affected by plastic pollution such as through the disruption of the thyroid hormone axis or hormone levels.

While solving the problem of plastic pollution may seem as easy as just implementing, recycling or cleaning up the empty bottles, the truth is that the

plastic causing the pollution can range in size from big to microscopic.

II. PLASTIC

A. USES

Food containers, plastic tableware, disposable cups, plates cutlery, compactable disc(CD),cassettes boxes, refrigerators liners, food related packaging, vending cups, fibers, tooth brushes bristles, bottles, floor tiles, shower curtains ,clamshell packaging fibers, textiles, carbonated drink bottles, peanut butter jars, plastic films, microwavable packaging, wide range of inexpensive uses including supermarket bags, plastic bottles, electronic equipment cases.

B. PROBLEMS

The nature is suffering because of thrown plastic on roads.

Many animals die by eating plastics. Around 99% of seabirds, non-biodegradable 22% of large marine mammals such as whales and dolphins, all sea turtles have been documented with plastic in their gut.

Plastic being non-degradable, it's hard to decompose plastic. It becomes a biggest disadvantages after its use which causes pollution.

III. PLSTIC

General term

We know that plastic is a non-biodegradable material. It takes century of year to get decomposed. It also decreases the fertility of soil. Many of the terrestrial and aquatic animals dies by eating plastic. So to dispose that plastic. We can use that plastic along with tar into roads for making it.

Firstly we have to cut that plastic waste into proper pieces. After cutting the plastic we have heat the tar at certain temperature and have to add plastic in that melted tar solution.

After getting tar heated we have to add plastic which will melt within that solution.

IV. THE PROCESS: MIXING PLASTIC INTO TAR ALONG WITH CASEIN

BRIEF PROCESS:

-) Pre-treatment: Collecting all type of plastic waste and cutting it into small pieces.
-) Heating the tar at high degree Celsius.
-) Addition of plastic into heated solution of Tar.
-) Addition of CASEIN to that solution.
-) Mixing that solution properly using big mixtures.

Initially we take tar and heat it. Then we add plastic waste to it. Plastic will melt in that tar solution .Now we come to know that with the help of casein we are able to increase strength of that road .

Again we have one big problem how to reduce the effect of toxic gases released from melting of plastic .Then we thought and come to know that the general plastic roads have composition of 25-30 kg of plastic in 100kg of tar but after some research we come to know that by using casein we are able to reduce plastic composition in tar solution to 17 kg to 20 kg plastic for 100 kg of tar which means that the quantity of toxic gases released by the melting of plastic will proportionately reduces as we cannot reduce the toxic properties of plastic which released in atmosphere (Dioxin) after melting of plastic .

In this way we are able to construct good quality roads having low cost and high tensile strength.

CASEIN

Casein is the name for a family of related phosphoproteins. These proteins are mainly found in mammalian milk making up 80% of the proteins in cows' milk and between 20% and 45% of proteins in human milk.

Casein is widely used in food additives; to a binder of safety machines. It is also used to increase the tensile strength of materials.

Advantages

- Relatively cheap costing.
- Core technologies were understood.
- Commercial-scale projects operational
- Conventional material Of construction can be used.
- Required raw material (plastic and tar) can be easily available.

Challenges

- While melting of plastic in tar, toxic gases are released in nature
- These toxic gases are not easily undergoes any chemical reaction

❖ Plastic used for the process

- Milk Bags / Oil Bags
- Food, Yogurt containers/ Plastic Glasses
- Cooking Oil Canisters
- Laminate Tubes (Tooth paste, Medicines)
- Carry Bags (all micron thickness) Blister Packing, Bubble wraps
- PET bottles (Bisleri, soft drinks, Toilet cleaning material,)
- Shampoo/ powder bottles / empty sachet
- Detergent Bags (Surf, Tide, Excel, Nirma etc)
- Food Item Bags (Wafer, Kurkure, Farsan, etc) wrappers
- Blister Packing, Bubble wraps
- Plastic flowers, Buckets

❖ Outcome

This process has three benefits:

- I. Effective use of all type of plastic waste.
- II. Lakhs of money will be saved by applying these techniques for construction of roads.
- III. For every 100 kg of tar only 17kg-20kg of plastic required for construction of roads.

In this way 100% of plastic waste is reused /recycled with no emission and no greater harm to environment.

❖ **SCOPE OF PROJECT**

Consideration the economical growth of our country and required quality of roads, there is vast scope in these fields. For constructing just 10km roads we required lakhs of money and considering geometrical area covered by India, total area covered is 3.287 million km² and most the roads are not properly build yet and the roads that built already are of average quality. by using plastic and tar we are able to built good quality roads in relatively less budget and with 50% more tensile strength.

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