

DIY BIOPLASTIC FROM ORANGE PEELS

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ABSTRACT

This project is based on the making of bioplastic from orange peels and ground coffee. The main aim behind this project is to decrease the amount of non-biodegradable plastic and to aware the society about the use of bioplastic instead of biodegradable and non-biodegradable plastic. We can use this bio plastic in our daily life. Also, it helps to decrease the amount of soil pollution in our environment. That's the idea behind a new technology which turns plant-based waste, such as orange peels, ground coffee into eco-friendly plastic.

Keywords : Biodegradable, Essence, Eco-Friendly, Orange Peel, Strength.

I INTRODUCTION

According to the researches, there are 8 million tonnes of orange residue in Brazil and over 31 million all over the world. Brazil and United States alone produce 38 percent of the world's orange and the peels that are wasted after juicing, which account for 50 percent of the orange, are usually eliminated by burning, which produces carbon dioxide and other greenhouse gases, or dumping into landfills, where the oil from rotting peels percolates into the soil, harming the plant. The same thing happens with the ground coffee. High number of coffee shops in the city generates large quantities of spent coffee grounds as waste. Which may result in the production of large amount of waste in the nature. Also the percentage of non-biodegradable waste and biodegradable waste increases day by day which may cause soil pollution. So , we are going to make the DIY bio plastic using natural materials like orange peels and ground coffee.

II FIGURES AND TABLES



III WORKING

We had 4 oranges and 25g coffee grounds to make bioplastic. First we took out the peels of all the oranges and keep the peels into the pot. Then we poured the water into it and heat it. After that we took out the peels and put it in a mixer grinder for some time until it get grind into the small particles or into the powdered form. Then we mix up the ingredients such as 15 ml of water, 25g of tangerine pell, 25g of corn starch, 2g sodium bicarbonate, 5ml lemon juice, 5ml sage oil, 5ml vinegar in a bowl and heat it. After heating we gave it a shape of bowl. After that we put it in a microwave oven for 3-4 minutes and our bioplastic bowl gets ready. At second time, we made the bioplastic bowl using orange peels and ground coffee both. At second time we do the same procedure as the previous one made for the bowl . The only difference between first and second bowl is that in the making of first bowl we used orange peels only and in the second one we used orange peels and ground coffee both.

The team performed a series of material experiments on the bio-plastic to understand how and to what degree the material would transform when subjected to various strains and stresses. Some of the lessons learned from our material experiments we learned the orange peel bioplastic had improved strength, and higher heat resistance. It can be used instead of plastic.

3.1 Functions of Ingredients:

- 3.1.1 Citric Acid : Used as a acidifier, as a flavouring and chelating agent
- 3.1.2 Corn starch : Starch is converted into polymer, the main ingredient in materials that have a plastic like feel.
- 3.1.3 Essence : To remove smell of oranges from object.
- 3.1.4 Sodium Bicarbonate : To make object tough and thick.

3.2 Mixture of all Ingradients :



IV CONCLUSION

The DIY bioplastic project really helps in reducing the use of biodegradable and non-biodegradable plastic. Also there are only few limitations of this project and we get the best benefits by using this bioplastic. In order to fully take advantage of this project we have to do more experiments on it and make it more better, also for the best results from this project we have to develop some more ideas about the other bioplastic projects.

V RESULTS AND DISCUSSIONS

The bioplastic can be made on demand based on the user requirements, and go directly back for distribution to it local community, reducing the need for transportation. Due to ease of production and accessibility of this material, it can be tailored with the desired parameters to suit, based on requirements for each project, but also fine tune the material performance within any given structure or object. The input of dehydrating the material would trigger an output of a self-assembly behaviour of the form. This was most dramatic in the coffee based and orange peel based bioplastic.

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LIMITATIONS

Product is not water proof .Bioplastic can contaminate recycling streams causing the plastic to be sent to landfill and for some compostable plastic there is not enough industrial composting facilities and very few methods of collecting the material that needs to go to them.