Biodegradable Plastic

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1.Abstract

At present, we see the use of traditional plastic everywhere in the world, but their utilization causesserious problems due to its non-degradable nature. The plastic thus being produced will be depositedon the landfill for 450 years before it degrades completely. Conventional plastic cause interruption in bio functions ofthe living organisms. Ingredients in plastic are extremely toxic and carcinogenic. Plastic usedin food industry can contaminate the packaged food. Plastic is made from non-renewableresources that are petroleum products. So in order to solve these problems we are trying to make starch based biodegradable plastics as a sustainable, eco-friendly, substituent for conventional plastic.

Keywords- Toxic,Carcinogenic,Sustainable,Eco-friendly

2. Introduction

Disposal of traditional plastic is huge technoecological problem. Hence this research aims to find a better alternative to conventional plastics. If commercialized, the process of making biodegradable plastics from starch can replace traditional plastics in the market as starch is available easily and in abundance. Further the characteristic properties of the plastic produced by this method depend on the concentration of it's components. Hence we can produce more than one type of plastic from this process according to our needs. This ensures large scale applications of our product.

3. Materials and Equipment required

3.1. Starch (To provide suitable thickness)

3.2. Vinegar (To dissolve the starch molecules)

3.3. Glycerin (Acts as a plasticizer or polymerizer)

3.4. Water

3.5. A stovetop

3.6. Stirrer

3.7. Aluminum foil

3.8. Nonstick pan

3.9. Measuring cups

4. Procedure

4.1. Add 7.5 gm of starch, 5ml of vinegar, and 5ml of glycerin and 50ml of water to a non-stick pan.

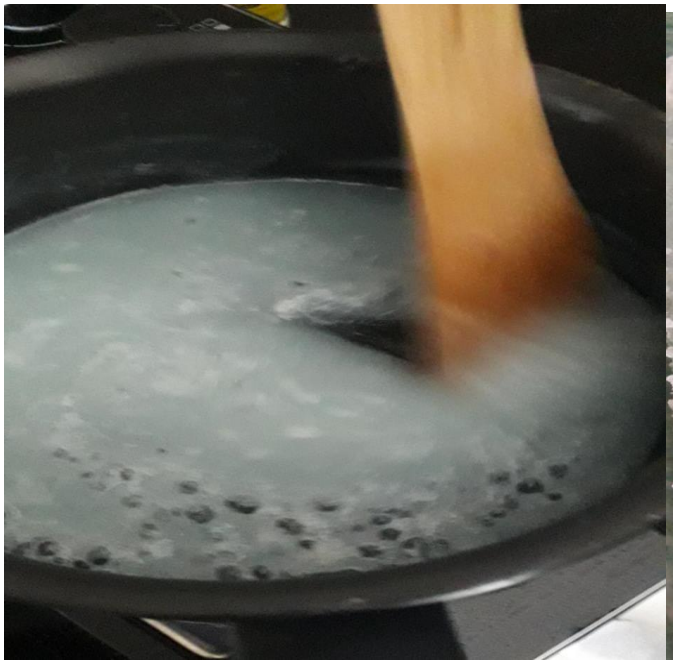
4.2. Combine all ingredients and stir the mixture well.

4.3. Place the pan on a stovetop and keep the flame medium-low.

4.4. Stir the mixture continuously together until we get rid of most of the lumps. As the mixture gets heated, it will become more translucent and thicken.

4.5. Now remove the mixture from the stove.

4.6. Spread it evenly on an aluminum foil or in a mound of desired shape.



The mixture on the stove

Plastic Sheet

The plastic molded as a bowl

5. Precautions

5.1. Do not overheat the mixture as lumps will start to form.

5.2.Avoid adding excess of water as it will alter the consistency of the product.

5.3. Spread the mixture immediately without losing any time.

6. Cost required (per 12gm product)

7.5 gm Starch 9INR

5ml Vinegar 0.45INR

5ml Glycerin 2.25INR

Total Cost is 11.65INR

7. Properties

Biodegradable plastics display more or less the same properties as traditional plastic .In fact offers some additional advantages.

7.1. Reduced carbon footprint

7.2. Better waste management

7.3. Degradability

7.4. Durability

7.5. Flexibility

7.6. Printability

7.7. Heat Resistance

7.8. Transparency

7.9. Gloss

8. Advantages

8.1. Biodegradable plastic are made from biomass like trees, grass, starch, etc. And from organic material which are easily degraded. They are easily renewable.

8.2. The biodegradable plastics are good for our environment. The process of making biodegradable plastic and it's combustion does not involve emission of carbon as a by-product.

8.3. Unlike biodegradable plastic, regular plastic needs oil for its production, so the biodegradable plastic are chance to give a recovery time for fossil fuels.

8.4. The time requirement for production of biodegradable plastic is almost half of that which is required for the production of regular or non biodegradable plastic so the production of biodegradable plastic is double of that of non biodegradable plastic.

8.5. The biodegradable plastics are easily renewable and the energy requirement for renewing bio plastic is also less as the plastic is made from fully biodegradable materials which are easy to renew. Bio plastics are efficiently reusable which is a clear advantage.

8.6. The process of making bio plastic doesn't release any harmful product which are produced during the process of making of traditional plastic. There are no toxins used in the process of making bio plastic so therefore it is completely safe for usage. Therefore the breakdown of bio plastic is completely harmless for us as well as for our earth

9. Applications

The characteristic properties of starch based biodegradable plastic can be altered according to our specific needs. And hence this product has varied applications.

9.1. There is huge demand for food packing as there are different types of food products packaging made from biodegradable plastic can be used as a wrapping material for wrapping organic food as well as branded products.

9.2.The food products such as vegetables and fruits have low shelf life, for these flexible plastic such as films or transparent containers can be a better option .Using biodegradable plastic is more protecting and prolonging shelf life of these food materials as compared to conventional plastic.

9.3.Rigid biodegradable plastic can be used for packaging cosmetics such as creams and lipsticks as well as beverage bottles and many more. This can also be used to package different kid's cosmetic products.

9.4.Containers made from rigid biodegradable plastic can be used for pots for planting trees.

It also gives us opportunities for pot-marketing.Gardeners can harvest their shrubs in pots at beginning which is convenient for them .Shrubs with pots can be directly plant into soil the pot being biodegradable it decomposes within few days and then plant's further growth begin.

9.5. We can also make mobile covers and toys from it.

9.6.By using special equipment and methods we can also make carry bags, disposal bags which are truly needed for today's age.

10. Acknowledgements

We would sincerely thank Hon'able Director Prof. (Dr.) R.M. Jalnekar for introducing the course project in our academics which provided us a opportunity for conducting this research.

We would also sincerely thank Prof. C.M. Mahajan for inspiring us to conduct this research and also for providing us all the necessary facilities.

We would also express our gratitude to our guide Prof. Manasi Ghamandewithout whom this research would have never been completed.

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