

# Furnishing of BioPlastics from the Agrobased Polymer and Thermoplastic Starch based Materials

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## Abstract

This paper mainly discussed about the agro based polymers which are mainly extracted from the plants. And how the bio plastics are prepared from that using the starch based materials. The agro based polymers are the renewable resources. It has the carbohydrates, saccharides, starch and oils which has been converted into some materials which has the properties of plastics. There are several processes to prepare the bio plastics form the Agro based polymers they are extraction of monomers from plants, by some chemical process, by fermentation process.

**Keyterms:** plastized starch, amylase, amylopectine, bio plastic

## I. INTRODUCTION

The agro based polymers have different families such as Polysaccharides. The polysaccharides contain Cellulose, Starch and plasticized starch. Cellulose is the agrobased polymer in this the linear polymer consist of D-glucose which is synthesized by plants and bacteria. To obtain the thermoplastic materials cellulose is modified by acylation which forms the nano composite materials after some acidic treatment. By using these components the bio plastics were formed using the natural products which are taken from the agricultural field. And in the thermo plastic starch materials it will be produced based on the heat and the temperature the starch will be composed and the plastics were produced.

## II. EXISTING SYSTEM

In the existing system plastics were founded as the non-degradable products which cause many effects to the environment. The non-degradable product will pollute the environments. Since the plastics were made up of organic polymers it will create an environmental damage because it will take longer time to decay. The plastic will contains synthetic and semi synthetic amorphous solid. Some plastics were manufactured for the petroleum. This will involve many chemicals and toxicological impact on human and animals. The plastics are the durable materials that are hard to eliminate. Once it will be used it will create the tremendous waste. Also the

normal plastics are the nonrenewable resources because it has the poly vinyl chloride. The substance the contain the poly vinyl chloride will not eradicate easily. Therefore it will create the huge problem to the environment. The non decade product will pollute the environment also it will spoil the life cycle of the human

## III. PROPOSED METHODOLOGY

In the proposed method the bioplastics were implemented. The starch is the composition of two different macro molecules amylose and amylopectin.

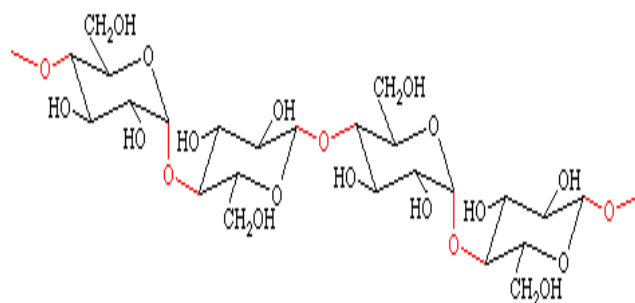
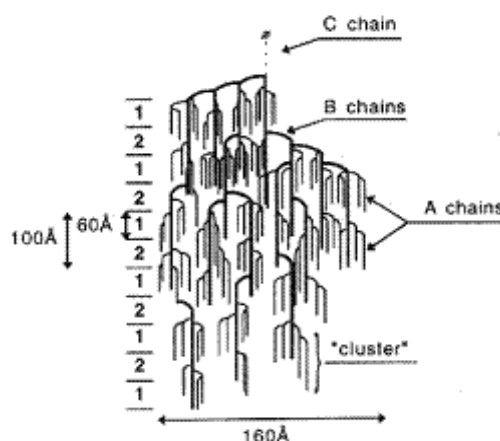


Fig 1: Structure of Amylose



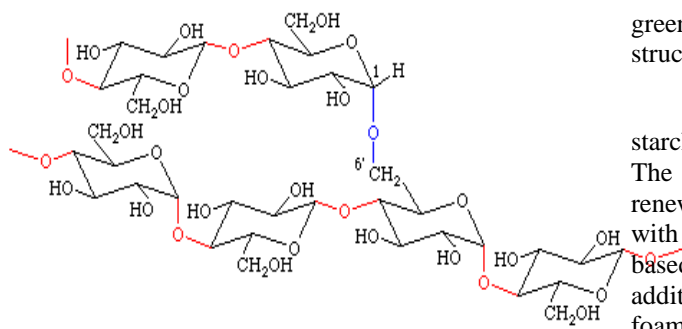


Fig 2: Structure of Amylopectin

To produce plastics the starch should be modified as destructured starch. In the destructuring agent is water. From this we obtain the starch gelatinization by combining water and heat. To overcome these issues non-volatile plasticizer will be added to decrease the Tm level. The plastized starch will be commonly called as thermo plastics.

The plasticizer will swell the starch after cooling the water which is added to the mixture using the turbo mixture. Then the plasticizer will undergo some mechanical treatment which will melt the material into the consistent state.

**A. Process of Plastized Starch**

The plastized starch consists of two types of behavior molten state behavior and solid state behavior. The starch that includes the degree of transformation has the properties of 70% of amylose and 98% of high amylopectin which shows the strong influence of viscosity in plastics. Depends on the viscosity and the elasticity of the starch material the plastic will be founded.

In the solid state behavior the starch will be identified based on three category crystallinity, water interaction, post process ageing. The morphological analysis will combine the un-axial tensile test that have shown the negative test in the process of the hybrid materials. The solid state of the starch will provide the plastic material will have to specification of plasticizer content of the starch formulation.

**B. The multiphase system for the Plastized Starch**

Lignin and cellulose are the two different materials associated together to form the component of bio polymer. By blending the two different polymers it will provide the powerful route to obtain the material. PLS will be blend with the other polymer it will give the bio plastics.

Also the starch based polymer is used for various applications in agriculture. The starch based application is used for mulch films, the covering of

green house. The water will be absorbed for the 3D structure of the starch based hydrogels.

We can produce the bio plastics for the corn starch, potato starch and from some other materials. The bio plastic will be a non-pollutant and it is renewable resources. The chemical reaction of starch with the hydroxyl molecules will give the starch based material like bio plastics and thermoplastics. In addition to that the starch can be transformed into foamed material by adding some water to that will form some different hydroxyl component will produce some other bioplastics which is also a non-pollutant renewable resource.

The non-covalent bonding between the intermolecular bonding produces some heat will form the component of the thermo plastics and it will be used as a byproduct of the bio polymers.

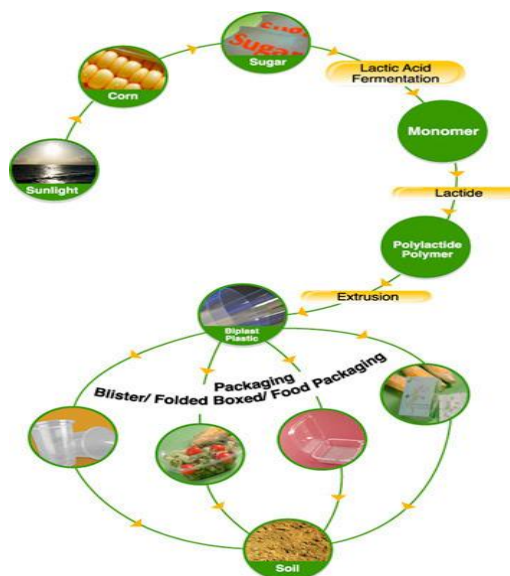


Fig 3: Bio Plastics

**IV. USAGE OF BIOPLASTICS**

The bioplastics are generally used in the major food packaging but will be used for major components of electronic goods and to manufacture the parts in vehicles. This will also be used to replace petrochemical based adhesives in the medical delivery systems. The exact opinion of the process will provide the bio plastic components for various purposes. Depending upon the polymer the degradable and bio degradable polymers will be classified.

Using the poly lactic acid in the sugar fermentation the cool drink cup will be manufactured. Also it will be used to make CD's and electronic casings. The lignin bioplastics will be used for electronic housings. And the plant oil based. The bio

plastics are used for the wide variety of the monitoring systems.

starch-polycaprolactone systems. *J. Env. Polym. Deg.* 1995, 3(2), 81-95.

## V. CONCLUSION

This paper provides a solution for the preparation of bioplastics from the agro based polymers. And it will also provide different physical and chemical properties of the efficient strategies to develop the starch based biodegradable polymers with the appropriate bio compatibility and the degradation rate. These bio plastics were used for many purposes and it will be renewable resources it will create a environment friendly behavioral nature.

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