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SYNTHESIS OF BIO-PLASTICS FROM WASTE NEWSPAPER AND BIOWASTE

INTRODUCTION

Bio plastics are plastics derived from biomass

They are biodegradable

PLA(polylactic acid) - Second most widely used bioplastic

PLA and their blends are used for the production of Fibres, Plastic container,etc...

PREPARATION OF RAW MATERIAL

WASTE NEWSPAPER

- Most common and easily available
- Converted to pulp, which can be done by using pulp mills.
- Preparation of paper sludge using newspaper and water in mills.
- This process remove lignin from paper and leaves cellulose fiber intact.

BIOWASTE

- ▶ Preparation of mixed fruit pulp.
- ▶ Allow to dry.
- ▶ Add at least a suitable plasticizer, a cross linking agent and a surfactant to the pulp.
- ▶ Pulps are blended to paste using hand blender.

PREPARATION OF BIOPLASTIC

EXTRACTION OF CELLULOSE FROM PULP

- Paper sludge is treated with 1-butyl-3-methylimidazolium chloride to extract cellulose.
- This co-solvent addition is kept at appropriate stirring condition.
- Allow fractionation of pulp into cellulose and hemi cellulose fraction.
- The process is ecologically and economically efficient alternative.

CONVERSION OF CELLULOSE IN TO DEXTROSE

- The process of breaking down cellulose is called cellulolysis.
- Cellulose is converted to cellobiose by the action of a cellulase produced by *Trichoderma reesei*.
- Then cellobiose is converted in to glucose by the action of a purified cellobiase produced by *Aspergillus terreus*.
- *Trichoderma reesei* is a fungus that has the ability to degrade cellulose very rapidly.

PREPARATION OF PLA BIOPLASTIC

- Preparation of dextrose from waste newspaper.
- Lactic acid is prepared by fermentation of dextrose.
- Heat applied to lactic acid .
- It causes them to link together and form long chain.

SYNTHESIS OF BIOPLASTIC FROM BIO WASTE

- Waste fruit skins are taken in the form of paste.
- Suitable plasticizer, crosslinking agents and surfactant are added to improve tensile property, blending etc...
- Mixture is refluxed at a temperature 85 degree celcius.
- Duranian flour added for increasing strength.

DISCUSSIONS AND FUTURE ASPECTS

- Prepared bioplastic sheets were in micrometers.
- Water resistant.
- Soft in touch, dark coloured due to presence of fruit waste.
- To improve flexibility elasticity by adding biomaterials.

Advantages of bio plastics over petroleum based plastic

- Bio degradable.
- Bio plastics are break down to humus,nutrient-packed,soil like substance that acts as natural plant food.
- PLA helps to reduce green house gas emission.
- PLA will not emit toxic fumes when incinerated.

Applications

- In electrical industries
- Medical products
- Packaging
- Sanitary products
- Gardening
- Catering products

CONCLUSION

- Bioplastics are **eco-friendly** product
- Bioplastics can be recycled
- It can be cleanly incinerated and industrially composted
- This plastics will replace the conventional plastics in future

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THANK YOU