Pectin Fibre

From food waste to sustainable clothing

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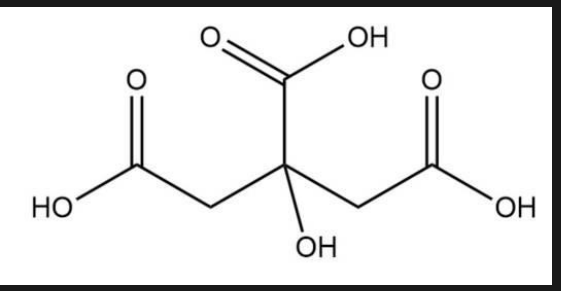

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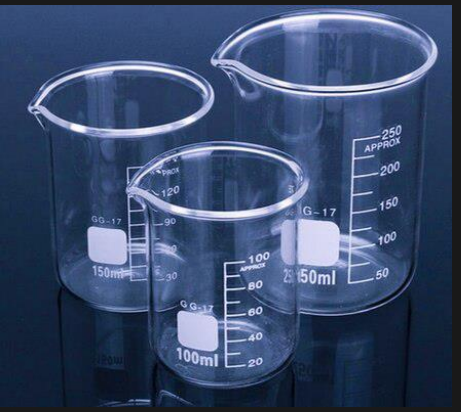
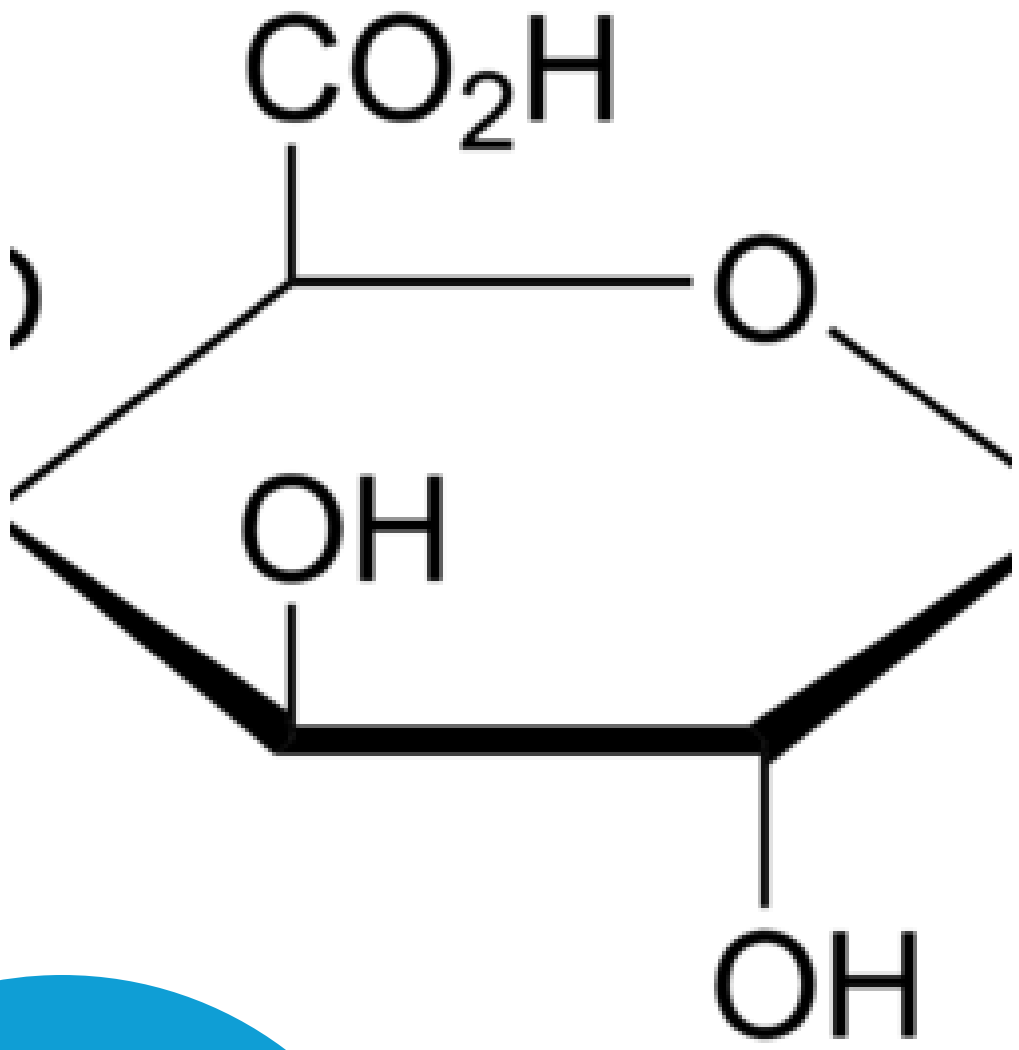


Introduction

- The clothing industry is a major polluter, with 60% of clothing made from synthetic fibres like polyester, which releases microplastics into the environment. These materials are non-biodegradable, contributing to 35% of plastics in the ocean. To reduce the pollution, I propose pectin fibre, a biodegradable material derived from fruit waste.

- Pectin, a natural polysaccharide found in citrus peels and apple pomace, is traditionally used in the food industry but holds significant potential for clothing owing to its biocompatibility and non-toxic properties. With an estimated 15-20 million tonnes of citrus peels bring discarded annually, pectin fibre presents a sustainable solution by transforming agricultural by-products into eco-friendly clothing



Scientific background

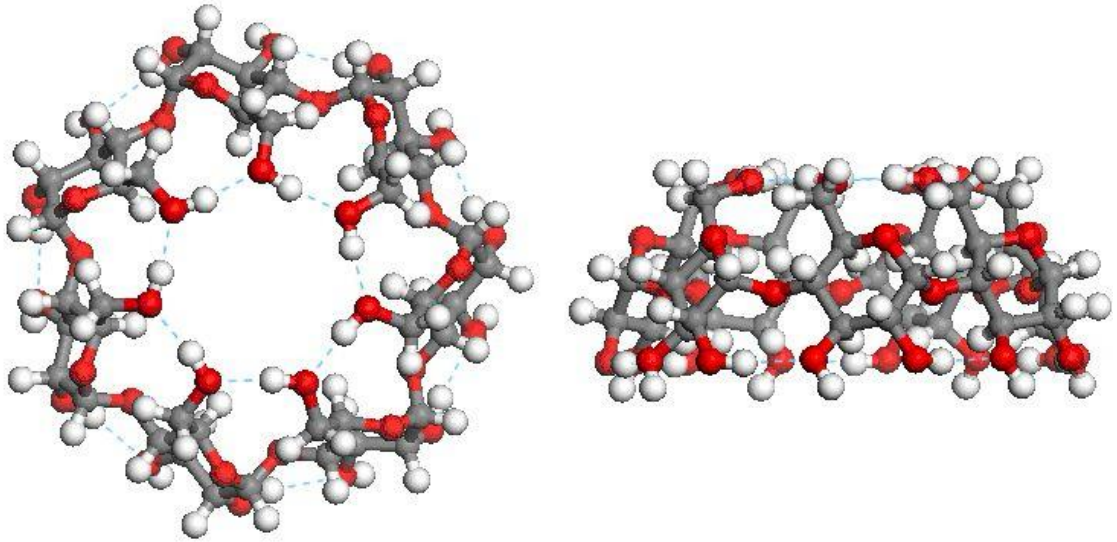
- Pectin is a polysaccharide mainly composed of galacturonic acid and has gel properties. It can be decomposed into water and carbon dioxide by microorganisms and will not cause pollution to the environment.

Proposed experimental design

- In order to make and test its physical properties and degradability, we need the following materials: peels (orange/apple), citric acid, calcium chloride. The equipment is beaker, syringe, filter paper, pH test paper.

Steps

- The first step is to extract the pectin: wash the peels, dry them, crush them, boil and filter with citric acid solution. The second step is to shape the fiber: push the pectin solution out through a syringe and immerse it in calcium chloride solution to solidify. After it solidifies, you can do the final test.



Tests

- Test for degradability: bury the fiber in soil and watch if it is degrade.
- Test for safety: test pH using test paper.
- Test for flexibility: just stretch it.

Future application

- Children clothing

Children clothing is the main target, why?

- Children grow really quickly and outgrow their clothes quickly, resulting in large amounts of textile waste. Pectin Fibre based clothing can decompose naturally, reducing the burden on landfills.

Conclusion

- In conclusion, It offers a alternative to synthetic textiles, contributes to reducing key environmental challenges such as microplastic pollution and textile waste. Its biodegradability and softness make it ideal for clothing. The potential of pectin fibre is not limited to its material benefits. By reusing agricultural byproducts, it also contributes to the economy, reducing waste and conserving resources. By using this innovation, we can turn waste into value, protect our planet and pave the way for a greener , more responsible world.