

Synthesising bioplastics

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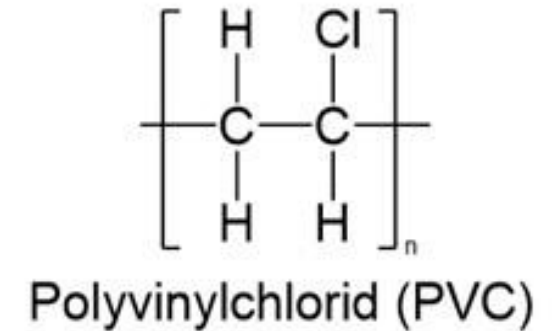
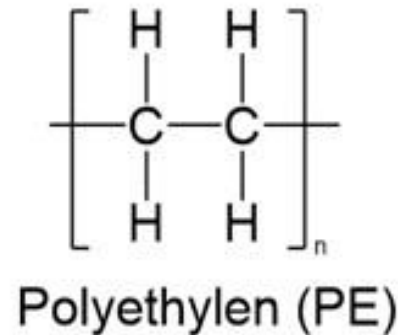


Plastics

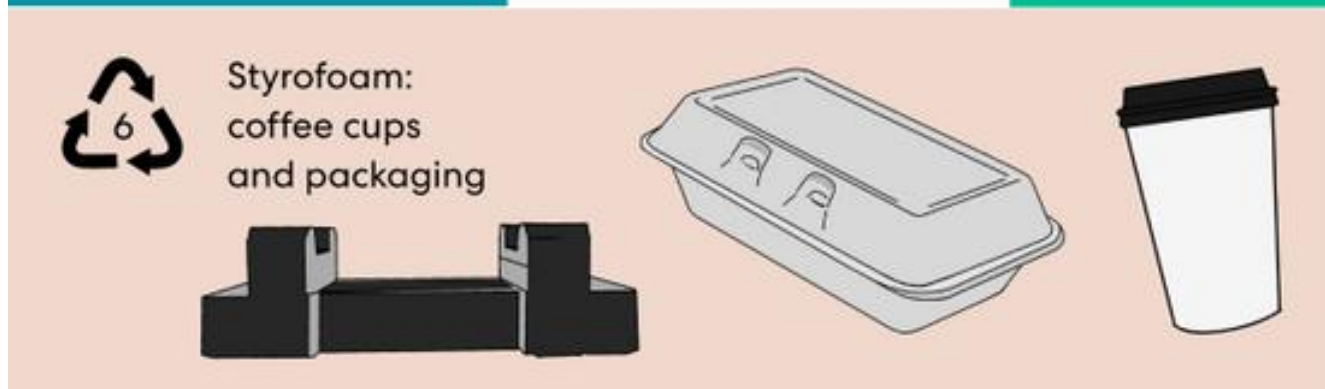
Plastics are a group of compounds that are made from **polymers**. Different polymers will have different properties.

Properties can include:

- Lightweight
- Durable
- Flexible
- Transparent



Uses of plastic



Is plastic in its current form good for the environment?

- Plastics are synthesised using non-renewable crude oil
- Plastics cannot be broken down easily
- Lots of plastics are single use
- Microplastics can pollute oceans and soils, which eventually can be ingested by animals



PROJECT: Synthesising bioplastics

The aim of our of project

We aim to create a plastic using reagents that are **environmentally friendly** and that can be **broken down easily**.

By changing the chemical makeup of plastics, we can ensure that plastic can be used forever **without running out** and **not cause harm** to the environment.

We wanted to ensure that the bioplastic we create emulates the properties seen in (polymer) plastic:

- Lightweight
- Durable
- Flexible
- Transparent
- Hard



BIODEGRADABLE



COMPOSTABLE



RECYCLABLE

Making plastic: our method



Honey



Vinegar

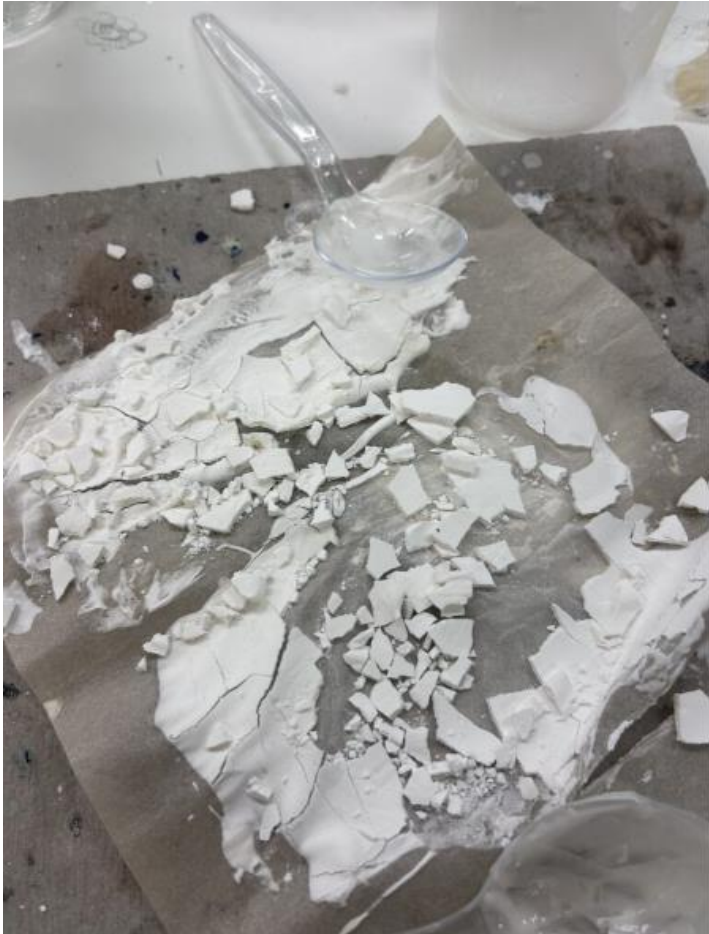


Water



Cornstarch

First result



Method

1. Ingredients:

Honey 1tsp

Cornstarch 1tbs

Water 15 tb

Vinegar N/A

2. Stir together and heat over Bunsen burner until thickened.

3. Pour over greaseproof paper and let dry

Issues and moving forward:

Plastic is **too brittle**

→ Add **less cornstarch**

Other results



During cooling



Fully dried

Improvements:

The plastic broke apart into small fragments

→ Let it cool for longer and pour onto a surface that does not change shape

Other results



Too thin and would not pull off the surface



Lots of honey → too sticky!



Thicker layer → Did not dry well

Final results



Method

1. Ingredients:
 - Honey 1tbs
 - Cornstarch 2tbs
 - Water 15 tsp
 - Vinegar 1tbs
2. Stir together and heat over Bunsen burner until thickened.
3. Let cool for 15 minutes
4. Pour over plastic sheet and spread thin



Where to go next?

Moving forward, the changes we are going to look into:

1. Making larger quantities
2. Pour into moulds to create different shapes
3. Look into different cooling methods to try and control the shape of the plastic better

