

# EDIBLE WATER PODS

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## OBJECTIVES

Students will:

- Make an edible polymer at home in the form of an edible water pod
- Make observations about the water pods
- Consider where these pods could be used

## MATERIALS NEEDED

- Blender
  - 2 bowls
  - ¼ teaspoon sodium alginate
  - 1 teaspoon calcium lactate
  - Spoon (measuring and stirring)
  - Paper towel
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## BACKGROUND INFORMATION

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*Please see the website for more information about the Circular Economy.*

Single use plastics are generally considered not to be compatible with the ideas of the circular economy. It is possible to synthesise edible and biodegradable water pods, which could replace plastic bottles. In these materials the polymer surrounds a liquid, acting as a container which can be eaten or otherwise will quickly breakdown fully in the environment. Similar products have been commercialised by NotPla, and you can read more about their work online.<sup>1</sup>

*Note: the sodium alginate and calcium lactate need to be food grade if you plan to consume them and can be purchased online or from health food stores.*

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## STEP-BY-STEP INSTRUCTIONS

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### BEFORE STARTING

- Make sure you have eye protection and protective clothing.
- If you plan on consuming the pods being made you need to ensure that the surface you are working on is sanitised along with any equipment, and make sure you wash your hands before starting and after handling the chemicals.

### METHOD

1. Add 250 mL water and ¼ teaspoon of sodium alginate to a blender. Blend for 20 seconds
2. Pour this into a suitably sized bowl (slightly more sodium alginate may be required depending on the purity and brand available). Label this 'solution 1'.
3. In a larger bowl add 1000 mL water and 1 teaspoon of calcium lactate. Mix well until the calcium lactate is fully dissolved. Label this 'solution 2'.
4. Fill a 1 teaspoon measuring spoon with solution 1 (the alginate mixture), and submerge this into solution two, ensuring the solution fully covers the spoon. Hold in the solution for 5 seconds.
5. After 5 seconds remove the spoon from the pod which should now have formed. Leave the pods in solution 2 for 15-20 mins. You can make up to 8 pods in the solution at any one time.
6. Carefully remove the pods from the solution
7. Observe the properties of the pods. If you have permission from a supervisor and everything was suitably hygienic you can eat them!

## Edible Water Pods

Age range: 11-18 years

### ADDITIONAL ACTIVITIES

- Make notes about how the pods look, taste and feel. Leave some pods in Solution 2 for longer than 20 mins (at stage 5) and see how this affects the properties of the pods.
- Brainstorm what uses these pods could have, especially if you would be able to contain a variety of different liquids. Think about how these uses would fulfil the ideas of the circular economy.

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*Please note that this practical has been adapted from an ACS practical designed by Emma Corcoran and Jane E. Wissinger.*

<sup>1</sup> <https://www.notpla.com/>