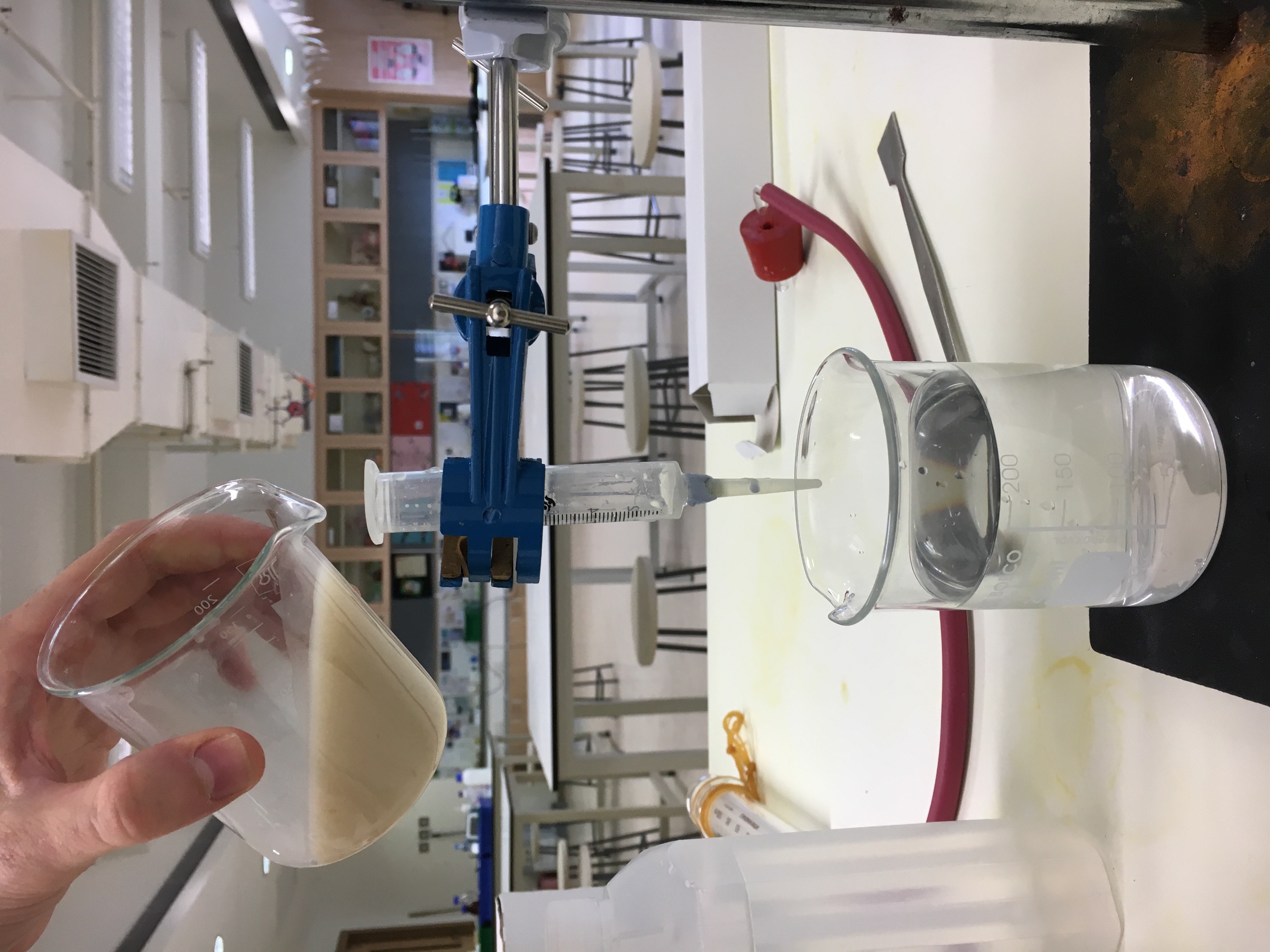
**Immobilised enzymes**

Equipment:

* Sodium alginate
* Calcium chloride dehydrate
* Yeast
* Distilled water
* 2 % Hydrogen peroxide
* 3 x 250ml beaker
* 1 x conical flask
* 1 x gas syringe
* 1 x plastic syringe
* 1 x sieve
* clamp stand
* 2 x Stirring spoon

Method:

1. In a beaker mix 4g sodium alginate with 100ml distilled water. Keep stirring.
2. In a different beaker mix 4g calcium chloride dehydrate with 200ml distilled water.
3. In a different beaker mix 10g yeast with 100ml distilled water.
4. Once the sodium alginate is fully dissolved add it to the yeast solution. Stir.
5. Set up the clamp and plastic syringe as shown this the picture. Add the tip of a dropper to the syringe (ask).
6. Set up so the tip of the plastic syringe is 5cm away from the surface of the calcium chloride dehydrate.
7. Add the yeast/sodium alginate mixture VERY SLOWLY to the top of the plastic syringe.
8. Observe. You should be making small enzyme balls in the calcium chloride dehydrate. These are immobilized enzymes.
9. Wash out your sodium alginate beaker (that is now empty).
10. Use a sieve to separate the immobilized enzyme balls from the calcium chloride dehydrate.
11. Rinse immobilized enzymes with distilled water. Remover any that don’t look like balls.
12. Add 10g immobilized enzyme balls to a conical flask.
13. Set up a clamp stand with a gas syringe and delivery tube.
14. Add 50ml hydrogen peroxide to the immobilized enzyme balls. Bung in. Measure the volume of oxygen produced in 30 seconds.
15. Seive balls. Rinse balls. Repeat.

Are the results repeatable? Can you use the immobilized enzymes multiple times and get the same results? Record your results in the space below.

