

21A – POLYMERS

INQUIRY

How can you change the properties of a polymer?

MATERIALS

- Beaker, 150-mL (2)
- Graduated cylinder, 10-mL
- Watch glass or Petri dish
- 2% sodium alginate suspension, 5 mL
- 2% sodium chloride solution, 100 mL
- 2% calcium chloride solution, 100 mL
- Pencil or marker
- Plastic fork

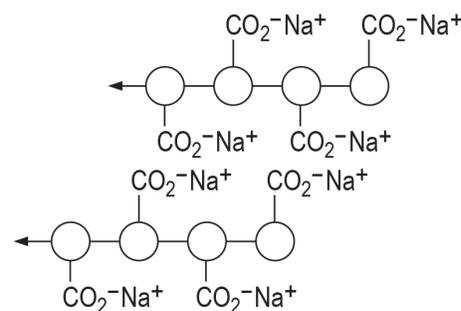


BACKGROUND

Sodium alginate is a polymer which can be extracted from brown seaweed and kelp. It is one of the structural polymers that help to build the cell walls of these plants. It has some unusual properties and a wide variety of uses.

The polymer can be represented like the image on the right.

When sodium alginate is put into a solution of calcium ions, the calcium ions replace the sodium ions in the polymer.



SAFETY

Follow these important safety precautions in addition to your regular classroom procedures:

- Wear safety goggles at all times.

PROCEDURE

1. Pour 100 mL of the 2% sodium chloride solution into a 150-mL beaker. Label the beaker "Sodium ions."
2. Pour 100 mL of the 2% calcium chloride solution into a 150-mL beaker. Label the beaker "Calcium ions."
3. Collect approximately 5 mL of the sodium alginate suspension in a graduated cylinder.
4. Describe the sodium alginate suspension in Table 1 on your answer sheet.
5. Using a pipette, squirt the sodium alginate into the calcium chloride solution. Experiment with the sodium alginate delivery to see if you can make worms and beads.

 **PROCEDURE** 

6. Use the plastic fork to remove a few worms and put them in a dish. Record your observations of the worms in Table 1.
7. Answer questions 1-4 on your answer sheet, and then experiment further as directed in question 5.

 **ANALYSIS** 

Complete the analysis on your answer sheet.

 **QUESTIONS** 

Answer the questions on your answer sheet.