

21A – POLYMERS

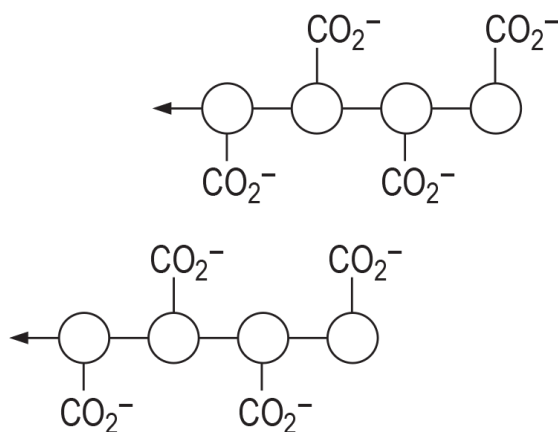
Analysis

Table 1: Observations

Trial	Observations
Sodium alginate	
Worms	

Questions

1. What is the formula of a sodium ion?
2. What is the formula of a calcium ion?
3. Adding the sodium alginate to a solution containing calcium ions created a “cross-linkage” between two polymers. Use the picture below to show how calcium ion can attach to two strands of the polymer, but the sodium ion to only one. Explain your drawing.



4. Predict how you think the properties of the polymer will change when it is poured into a solution of sodium ions.
5. Try it! Describe how the polymer changed when it was poured into the sodium ion solution. Did this agree with what you predicted?
6. Based on evidence from what you see, explain what happens in this experiment in terms of the ions and the polymer molecules. Use the term 'cross-linking' in your answer.
7. If you needed to create a cross-linked polymer with sodium alginate, but did not have a source of calcium ions, which of the following solutions could be used as a substitute to make worms: Potassium chloride, copper(II) chloride, lithium chloride? Explain your reasoning.
8. Alginate is a common food additive, E400. It is used as a thickener, stabilizer and gelling agent. It is often found in ice cream, where it is used to thicken the product so that even if it melts, it does not drip too much. Find three other foods that contain alginate. Try to think of a reason why it might be included in at least two of the products you have found.