Name Period Date

Making Polymers Lab - Experimenting with Corn Plastic

Now that we have reviewed some background about PLA, we are going to make our own corn plastic. Keep in mind that this is not the same process used to commercially manufacture PLA. Once we have made the plastic, we are going to test its solubility and design an experiment to test how biodegradable it is.

Part One: Making the Corn Plastic

1. Have one person from your table go to the supply table and get a plastic bag.
2. Write your table number on the bag.
3. Select a different person to return to the supply table and add the following items to the bag:

2 spoons of corn starch

2 spoons of water

2 drops of corn oil

1. Have one group member seal and knead the plastic bag until the ingredients are well mixed.
2. Use the electronic balance to find the mass of the bag and its ingredients. Record the mass here \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Write at least two qualitative observations about the ingredients before heating.
4. Select another person to bring the plastic bag back to the supply table to be microwaved.
5. After the plastic has been heated, find the mass again. Record the mass here \_\_\_\_\_\_\_\_

What happened to the mass after heating the ingredients?

1. Write at least two qualitative observations about the ingredients after heating.
2. While you are waiting on the plastic to cool, view this video about how plastic is made -

<http://preview.discovery.com/tv-shows/other-shows/videos/how-stuff-works-corn-plastic/>

1. You may create an appropriate shape out of the plastic.
2. Compare the plastic you made to the objects made in the 3D printer. How are they similar? How are they different.

Part Two - Testing Solubility

Now that we have made plastic, we are going to try to test its solubility. Our friends from Zork have left us some liquids to use to test the solubility of our plastics.

1. What does solubility mean?
2. Do you think the plastic can be dissolved? Why or why not?
3. Send one person to the supply table to gather the following items:
   1. One small beaker
   2. One mini scoop of corn starch
   3. One drop of corn oil
   4. One drop of water
   5. 30 ml of the liquid of your group’s choice
4. Test the solubility of each of the items using 10 ml of your chosen liquid as the solvent and the corn starch, corn oil, and water as your solutes. You will do these individually.
5. Based on your test results, do you think your corn plastic will dissolve in the liquid? Why or why not?
6. Obtain 30 ml of your chosen liquid and place your corn plastic in it. We will check on them tomorrow.

Part Three: Biodegradable

1. What does biodegradable mean?
2. Design an experiment (write a materials and procedures list) to test how biodegradable your corn plastic is.