

SkillCheck

- Observing
- Measuring
- Controlling variables
- Communicating

Safety

- Iodine and starch solutions will cause stains.

Materials

- 1 vitamin C tablet, 100 mg or less
- mortar and pestle
- 100 mL beaker
- water
- stirring rod
- 10 mL graduated cylinder
- 2 medicine droppers
- iodine-starch solution
- up to 8 medium test tubes
- samples of fruit juices or other beverages

We can use chemical change to help us analyze foods for the presence of certain chemicals such as vitamin C (chemical formula $C_6H_8O_6$). In this activity, you will test for the presence of vitamin C in different drinks.

Question

How can chemical changes be used to detect vitamin C in fruit drinks?

Procedure**Part 1 Preparing a Vitamin C Test Solution**

1. Grind up the vitamin C tablet using a mortar and pestle.
2. Transfer the grindings to a 100 mL beaker. Use about 100 mL of water to wash the grindings out of the mortar and into the beaker. Stir the liquid in the beaker using a stirring rod. Some of the grindings will not dissolve but this is not a problem, because all of the vitamin C will be dissolved.
3. With the graduated cylinder, measure 5 mL of the iodine-starch solution into a test tube.
4. Use a clean medicine dropper to add some of your vitamin C solution to the iodine-starch solution. Keep adding until you see a definite change in colour. Note the colour change. This colour change indicates that the vitamin C solution has destroyed the iodine in the iodine-starch solution.
5. Do a similar test with water. Measure 5 mL of the iodine-starch solution into a clean test tube. Using a second, clean medicine dropper, add water to the iodine/starch solution. Note what happens. Remember that water does not contain vitamin C.

Part 2 Testing Fruit Juices for Vitamin C

6. Select several fruit drinks for testing. Choose some that advertise that they contain vitamin C and some that have an unknown vitamin C content.
7. With your group, plan a procedure to measure vitamin C in the fruit drinks. Make sure to plan a fair test. For example, it is important that the same amount of fruit drink is in each test tube so you can compare results.
8. Test the fruit drinks to see which have more vitamin C. You can do this by counting the number of drops needed to cause a colour change.
9. Clean up and put away the equipment you have used.

Conclude and Apply

1. Explain how a chemical change involving the chemical reaction of vitamin C with an iodine solution can produce a test for the presence of vitamin C.
2. List the fruit drinks in decreasing order of amount of vitamin C. Support your conclusions by presenting your experimental data along with your results.