Science 9-Biology
Experiment 6-4—Testing for Vitamin C

Purpose: To test some foods for the presence Vitamin C

Materials:
- Small dropper
- Graduated Cylinder or Burette for Indophenol Solution
- 125 mL Erlenmeyer Flask
- 100 mL Beaker
- 0.1% Indophenol Solution
- Ascorbic Acid Solution
- Five juices or drinks

Background:

Positive Test for Vitamin C

When a liquid containing Vitamin C is added to Indophenol Solution, the colour changes from Blue to Clear.

The more drops of liquid it takes to change the colour, the LESS the amount of Vitamin C there is in the liquid.
Testing Liquids for Relative Amount of Vitamin C

1. Using a burette, add 5 mL of Indophenol Solution to a clean 125 mL Erlenmeyer Flask. (Your teacher can help you with this)
2. Add a small sample of Orange Juice to a 100 mL beaker. Your teacher can help you with this. Put a clean small dropper into the beaker.
3. READ THIS WHOLE STEP! Using your dropper, SLOWLY add Orange Juice, drop by drop to the flask with the Indophenol Solution and swirl it. COUNT THE NUMBER OF DROPS of the Orange Juice it takes to make the Indophenol Solution turn CLEAR. Record the number of drops in the Data Table on Page 4.
4. Pour the contents of the flask and the beaker down the sink and rinse them both out well.
5. Clean out the dropper and the bulb! Your teacher will show you how to do this.

6. Using a burette, add 5 mL of Indophenol Solution to a clean 125 mL Erlenmeyer Flask. (Your teacher can help you with this)
7. Add a small sample of Grapefruit Juice to a 100 mL beaker. Your teacher can help you with this. Put a clean small dropper into the beaker.
8. READ THIS WHOLE STEP! Using your dropper, SLOWLY add Grapefruit Juice, drop by drop to the flask with the Indophenol Solution and swirl it. COUNT THE NUMBER OF DROPS of the Grapefruit Juice it takes to make the Indophenol Solution turn CLEAR. Record the number of drops in the Data Table on Page 4.
9. Pour the contents of the flask and the beaker down the sink and rinse them both out well.
10. Clean out the dropper and the bulb!

11. Using a burette, add 5 mL of Indophenol Solution to a clean 125 mL Erlenmeyer Flask. (Your teacher can help you with this)
12. Add a small sample of Gatorade to a 100 mL beaker. Your teacher can help you with this. Put a clean small dropper into the beaker.
13. READ THIS WHOLE STEP! Using your dropper, SLOWLY add Gatorade, drop by drop to the flask with the Indophenol Solution and swirl it. COUNT THE NUMBER OF DROPS of the Gatorade Juice it takes to make the Indophenol Solution turn CLEAR. Record the number of drops in the Data Table on Page 4. If it doesn’t turn clear after 50 drops, just put “> 50” in the Data Table under “Number of Drops…”
14. Pour the contents of the flask and the beaker down the sink and rinse them both out well.
15. Clean out the dropper and the bulb!
16. Using a burette, add 5 mL of Indophenol Solution to a clean 125 mL Erlenmeyer Flask. 
   (Your teacher can help you with this)
17. Add a small sample of Apple Juice to a 100 mL beaker. Your teacher can help you with 
   this. Put a clean small dropper into the beaker.
18. READ THIS WHOLE STEP! Using your dropper, SLOWLY add Apple Juice, drop by 
   drop to the flask with the Indophenol Solution and swirl it. COUNT THE NUMBER OF 
   DROPS of the Apple Juice it takes to make the Indophenol Solution turn CLEAR. 
   Record the number of drops in the Data Table on Page 4.
19. Pour the contents of the flask and the beaker down the sink and rinse them both out well.
20. Clean out the dropper and the bulb!

21. Using a burette, add 5 mL of Indophenol Solution to a clean 125 mL Erlenmeyer Flask. 
   (Your teacher can help you with this)
22. Add a small sample of Pineapple Juice to a 100 mL beaker. Your teacher can help you 
   with this. Put a clean small dropper into the beaker.
23. READ THIS WHOLE STEP! Using your dropper, SLOWLY add Pineapple Juice, drop 
   by drop to the flask with the Indophenol Solution and swirl it. COUNT THE NUMBER 
   OF DROPS of the Pineapple Juice it takes to make the Indophenol Solution turn CLEAR. 
   Record the number of drops in the Data Table on Page 4.
24. Pour the contents of the flask and the beaker down the sink and rinse them both out well.
25. Clean out the dropper and the bulb!

26. Using a burette, add 5 mL of Indophenol Solution to a clean 125 mL Erlenmeyer Flask. 
   (Your teacher can help you with this)
27. Add a small sample of Ascorbic Acid Solution to a 100 mL beaker. Your teacher can 
   help you with this. Put a clean small dropper into the beaker.
28. READ THIS WHOLE STEP! Using your dropper, SLOWLY add Ascorbic Acid 
   Solution, drop by drop to the flask with the Indophenol Solution and swirl it. COUNT 
   THE NUMBER OF DROPS of the Ascorbic Acid Solution it takes to make the 
   Indophenol Solution turn CLEAR. Record the number of drops in the Data Table 
   on Page 4.
29. Pour the contents of the flask and the beaker down the sink and rinse them both out well.
30. Clean out the dropper and the bulb!
31. Place the flask, dropper and beaker in the place designated by the teacher.
32. Clean up your lab station and wash your hands.
Observations:

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Name of Sample</th>
<th>Number of Drops to Change From Blue to Clear</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orange Juice</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Grapefruit Juice</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Gatorade</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Apple Juice</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Pineapple Juice</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Ascorbic Acid Solution</td>
<td></td>
</tr>
</tbody>
</table>

Questions:

1. Which juice, drink or solution appeared to have the **highest content** of Vitamin C (took the least number of drops to change the colour to clear)?

2. Was there any juice or drink tested that contained **no detectable Vitamin C** (Still didn’t go clear after 50 drops were added.)?_________________

   If so, name the sample(s) ______________________________________________________

3. Describe a **positive test** for the presence of Vitamin C in a liquid. Outline the **procedure** and the **result** for a **positive test**._________________________________________________________

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4. How can you tell the **relative amounts** of **Vitamin C** in several samples using this test?

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5. What are the **main functions** of **Vitamin C** in the body? __________________________

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6. What **condition** results from a severe lack of **Vitamin C** in the diet?__________________

7. Draw a picture of a food which is high in Vitamin C content: