
Electrified Fruit!

Background

Most electrolytes are solutions of acids, bases and salts. Electrolyte reactions are triggered by current. The electrolyte splits up chemically when current passes through it. Vegetables and fruits contain varying amounts of electrolytes. Acids and bases can be tested by testing the pH. (Percentage of Hydrogen ions.)

Problem Statement

Is there a relationship between the electrolytes of a fruit and the pH of that fruit?

Hypothesis

Formulate your hypothesis based on the problem statement.

Equipment

CASIO* EA100 Data Analyzer.
Voltage Probe
Copper Penny
Zinc Washer
Various Fruits and Vegetables
pH Probe or meter
Knife
*Optional - CASIO Graphing Calculator



Procedure

1. First part to the procedure may be done as a group activity or you may follow the directions for using the EA100 on the short form reference card contain in the instrument case or follow steps 2-5.
2. Plug the electrical probe into the EA100 in Channel One (CH1) on the top of the EA100.
3. Cut two small slits in each fruit or vegetable.
4. Put a copper penny in one slit and a zinc washer in the other.
5. Attach the red clip to the copper penny and the black clip to the zinc washer.
6. Turn on the EA100 by pushing the red button labeled ON/OFF..
7. Press the MODE button changing the EA100 to MULTIMETER MODE. The word "MULTIMETER" will appear in the lower left of the EA100 view screen.
8. Read the value and write it in your journal and turn off the EA100.
9. Test each of the fruits and vegetables in the same way, recording your data.
10. Now you are ready to test the pH.
11. For each piece of fruit or vegetable you tested previously use the pH meter to check for the pH. Pull the bottom cover off the small end of the meter. Touch the uncovered end to the fruit or vegetable. Press the "on" button. Record the reading that appears in the window.
12. Turn off the meter after each use.

Note: The EA100 Data Analyzer may be used in place of the pH meter following the directions on the quick reference card in the EA100 case. You will also need the pH probe that attaches to the EA100.

Results

1. What fruits and Vegetables did you find to have the highest electrolyte reading?

2. Which ones had the highest pH reading?

3. Was there a correlation between the electrolytes and the pH readings? Explain.

Conclusions

Relate your conclusions to your original hypothesis. Draw a table showing the electrolytes and pH of each specimen, from highest to lowest readings. Draw a bar graph reflecting your findings.

*Optional Activity:: Data can be transferred to Casio Graphing Calculator, graphed and printed using the computer.