**Fruit Battery Lab**

**Purpose**: To determine the materials needed to make a voltage producing electrochemical cell.

**Part** **1**

**Procedure**:

1. Select one piece of fruit. Carefully cut small slits into the fruit. The cuts should be parallel and 2cm apart. Insert one zinc strip into each cut.
2. Touch the leads of the voltmeter to each strip. If the voltage fluctuates then could to five. Record the voltage after your count to five.
3. Remove one zinc strip and replace it with copper strip. Repeat step 2.
4. Continue to replace the strips and repeating step 2 until you have recorded the voltage from every combination of metals on the table.

**Data and Observations:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Zinc** | **Copper** | **Iron** | **Lead** |
| **Zinc** |  |  |  |  |
| **Copper** |  |  |  |  |
| **Iron** |  |  |  |  |
| **Lead** |  |  |  |  |

**Part 2**

**Procedure:**

1. Identify the combinations of metals that produced the highest voltage. Wash the two strips so there is no fruit juice on them. Use the steel wool to clean the strips.
2. Fill a 250mL beaker half full with clean water.
3. Place the metals from the step 5 in the beaker of water. Place them so they are parallel and about 2 cm apart.
4. Connect the volt meter to the strips. Record your reading.

**Data and Observations:**

|  |  |
| --- | --- |
| Best combination of metals |  |
| Voltage produced in clean water |  |

**Analyze:**

1. In Part 1, which combination of metals produced the highest voltage?
2. In Part 1, which combination of metals produced the lowest voltage?
3. In general, how did the voltage produced by two similar metals compare to when the metals were different types?
4. In Part 2, how did the voltage produced by the two metals when they were placed in water compare to when they were in the fruit? Give a possible explanation for this result.
5. Compare your results to others in the class with different fruits. What fruits seem to work the best?

**Conclude and Apply:**

1. What materials are needed to produce a high voltage electrochemical cell?
2. Suppose you needed to produce a higher voltage from a fruit battery. Suggest two ways to get the highest voltage possible.
3. Batteries purchased from stores are used for many devices like flashlights and cell phones. List a few reasons why fruit batteries would not be a good replacement for the store bought batteries?