Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Assignment #:\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_ Block:\_\_\_\_\_\_\_\_

**Leaf Chromatography**

**Background Information:**

**Mixtures** are a combination of compounds and elements that has not formed a new substance and whose proportions can be changed without changing the mixture's identity.

* Mixtures are not chemically combined.
* They are made of elements, compounds, or both.
* The parts of a mixture do not change their properties.
* A mixture may have any amount of parts.
* Energy is not absorbed or released when a mixture is made or separated.
* A mixture can be separated by physical means.

Leaves are nature's food factories. Plants take water from the ground through their roots. They take carbon dioxide from the air. Plants use sunlight energy to convert water and carbon dioxide into glucose.

* **Glucose** is a type of sugar.
* Plants use glucose as food for energy and as a building block for growing.
* The process of converting CO2 and water to glucose is called **photosynthesis**.
* A chemical called **chlorophyll** helps make photosynthesis happen.
* Chlorophyll is a **pigment** that gives plants their green color. Pigments are compounds that absorb light.

Plants have several kinds of pigments. They play an important role in capturing light energy for the photosynthesis. Pigments are responsible for the colors we see in leaves because they reflect light at that wavelength.

* Chlorophyll reflects green light
* Anthocyanins reflect red light
* Carotenoids reflect yellow light

**Paper Chromatography** is a method to separate mixtures into their individual parts. Chromatography means "color writing." The mixture of pigments in a leaf may be separated into bands of color by paper chromatography. With this technique the parts of a mixture in a liquid are separated. The separation takes place by **absorption** and **capillary action**. The paper holds the substances by absorption; capillary action is a force that pulls the substances up the paper at different rates. Pigments are separated on the paper and show up as colored streaks. The pattern of separated components on the paper is called a **chromatogram**.

**Safety:**

* Alcohol is poisonous- keep away from your mouth!
* Wash your hands with soap when you have finished this lab.
* Goggles must be worn the entire time during this lab!

**Research Question:** What pigments are in a leaf?

**Hypothesis:**

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**Materials:**

Leaves, beaker, stirring rod, hot water, paper towels, filter paper, scissors, plastic wrap, hand lens, isopropyl alcohol, masking tape, aluminum pan, ruler

**Procedure:**

1. Use a piece of masking tape to label a beaker with name & block.
2. Tear a leaf into small pieces. Make the pieces as small as possible.
3. Put the pieces of leaf in a beaker.
4. Pour enough alcohol into the beaker to cover the leaf pieces completely.
5. Use the stirring rod to mix the leaf pieces and alcohol.
6. Cover the beaker with plastic wrap and set in an aluminum pan that is half full of hot water.
7. Let the leaves soak overnight.
8. Cut the filter into a strip that is 2cm wide and about 10 cm long.
9. Tape the strip of filter paper to a pencil.
10. Lay the pencil across the top of the beaker. Wind the paper around the pencil so that the tip of the paper just barely touches the alcohol.
11. Wait for the alcohol/pigment mixtures to travel up the filter paper, re-read the background material carefully.
12. Take the filter paper strip from the beaker and place it on a paper towel to dry.
13. Observe the strip with the hand lens.

**Data:**

|  |  |
| --- | --- |
| Draw and color filter paper | Describe observations: |

**Conclusions:** In complete sentences, write a conclusion according to Reagan Lab Format.

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**Evaluations:** In complete sentences, write an evaluation according to Reagan Lab Format.

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