Extension: Chlorophyll Chromatography

Purpose: You will be able to design and carry out an investigation to separate the pigments from a leaf by paper chromatography. You will identify a mixture by separating it into the different compounds

Materials:

* safety goggles
* chromatography paper or filter paper cut into strips
* chromatography solvent (commercially available: 90% petroleum ether and 10% acetone)
* 3 Beakers
* Scissors
* graduated cylinder
* Mortar and Pestle
* spinach leaf (fresh) or other leaves
* test tube rack and 3 test tubes
* ruler
* 6 toothpicks

Procedure: (Include all safety procedures)

1. Obtain a spinach leaf.

2. Cut the leaf into small pieces and place into the mortar

3. Grind the leave into the smallest bits possible (this will take at least 1 minute)

4. Add a pinch of salt and 10 mL alcohol; grind again (at least 1 more minute)

5. Place the mixture in a beaker and cover with plastic wrap, set aside for 10 minutes and prepare the other 2 leaves into separate beakers (3 beakers total). Make sure to rinse the mortar and pestle inbetween.

6. Prepare your strip by wrapping the test strip around a toothpick and lowering it into the test tube; don’t let it touch the bottom

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7. Make a pencil line 1 cm up from the bottom end of your strip and use your second toothpick to place a drop of your leaf solution onto the line

8. Add 5 mL of alcohol to the test tube and lower your strip into the test tube

9. Wait 30 Minutes and continue to prepare the other 2 leaves

10. Set the strips aside to dry, if they do not dry by the end of your class period then you can leave them on a paper towel with your names on it and check again next class.

Data: Colors/Pigments Observed (how many different colors, describe them)

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| --- | --- | --- |
| Leaf 1 | Leaf 2 | Leaf 3 |
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Diagram of strips: (use colored pencils to show the separation of pigments)

Analysis:

1. What was the purpose of the salt?

2. Which leaf did you see the best results?

3. Did any of the results surprise you? If yes, why?