

Chromatography

Needed Materials: Acetone fingernail polish remover, test tubes or other empty containers (enough for 5 containers per group), felt tip markers, coffee filters, pigment guide, masking tape, scissors, spinach leaves, mum leaves, iceberg lettuce, and leaves of various plants found in your schoolyard.

Safety Rule: Avoid inhaling the vapors from the acetone and spilling it on your clothing.

Student Information: The following information will provide you with the steps for conducting your plant chromatography experiment. It is important to hold all of the variables constant except for those that are being manipulated. Constant (or controlled variables) would be such things as: the length of the filter paper strip, the amount of time the paper is left in the solution, the amount of acetone in the container, the size of the container being used, etc. Manipulated (or independent) variables would be those things that we change to see if the response will be different, such as: type of plant being studied. The responding (or dependent) variable for this experiment will be the different pigments found in each of the different types of vegetation.

The reporting form for this experiment is set up so that you can determine how many different kinds of vegetation you would like to use, the kind of container you would like to use and how long your strips of filter paper will be. Also remember that a good scientific experiment is repeated a minimum of three times. Therefore, your data will be more accurate if you conduct several experiments that are exactly the same and then compile an average of your data before submitting it.

Procedural Steps for Conducting the Investigation:

1. Collect two different plants from your schoolyard. You are going to test these two plants along with the spinach, mum leaves, and iceberg lettuce.
2. Label each container with the kind of plant you are testing.
3. Place a different leaf in the bottom of each test tube and crush it.
4. Pour about 2 cm. of acetone (fingernail polish remover) into each of your test tubes.
5. Let this sit twenty-four hours.
6. Cut five strips out of the middle of a coffee filter.
7. Place the end of one coffee filter strip in each of the test tubes. The solvent will travel up the paper, and as it does, it will dissolve and deposit the separate pigments.
8. After twenty-four hours, check your results.

9. Remove the strips of paper from the test tubes and lay them on dry paper towels that are labeled with the type of plant extract found on that strip.
10. Use a magnifying glass and a pigmentation guide to determine the types of pigments in each extract.
11. After group and classroom discussions have occurred, enter your data onto the Chromatography reporting form on the COILS web site by following the directions provided.