

EXERCISE 7 - Postlab

1. What is the function of the pigments present in spinach leaves?
2. During chromatography, a mixture of molecules is separated when a mobile phase flows past a stationary phase.
 - a. Identify the mobile phase in your experiment.
 - b. Identify the stationary phase in your experiment
 - c. Explain **how** the different pigments were separated as the mobile phase flowed past the immobile phase.
3. Using the data you collected during lab, determine the R_f value of every pigment separated on your TLC plate. (The R_f value for each pigment is defined as the migration distance of the pigment divided by the migration distance of the solvent front.)
4. Some pigments found in plants are listed in the table below. Make a list to show which of these pigments you were able to identify in your chromatogram.

<u>Pigment</u>	<u>Color</u>
Anthocyanins	red
Carotenes	orange
Chlorophyll a	bluish-green
Chlorophyll b	yellow-green
Pheophytin	gray
Xanthophyll	yellow

5. In this experiment you plotted the absorption spectra for three different pigments isolated from spinach leaves: beta-carotene, chlorophyll a, and chlorophyll b. Compare your 3 absorption spectra with the labeled absorption spectra for beta-carotene, chlorophyll a, and chlorophyll b that are shown in the Prelab. Then label each absorption spectrum on your graph with the name of the pigment that it corresponds to.
6. One way to characterize the absorption spectrum of a particular substance is to identify the wavelengths where peaks in absorbance occur. The wavelengths where these peaks occur are called “wavelength maxima” or “absorbance maxima.”
 - a. Identify the wavelength of each absorbance maximum for chlorophyll a.
 - b. Identify the wavelength of each absorbance maximum for chlorophyll b.
 - c. Identify the wavelength of each absorbance maximum for beta-carotene.
7. Of the 3 pigments you used for plotting absorbance spectra:
 - a. What is the name and R_f value of the one **most** strongly attracted to the mobile phase?
 - b. What is the name and R_f value of the one **least** strongly attracted to the mobile phase?
 - c. What is the name and R_f value of the one with **intermediate** attraction to the mobile phase?
8. Goldfish skin and chicken egg yolks typically have a yellow, orange, or reddish-orange color. However, these tissues are practically colorless if the respective animal is not permitted to eat photosynthetic plant tissue. Propose a hypothesis to explain these observations, and then explain how you would test your hypothesis.