

Food Dye Chromatography Worksheet

Data Table

To compare and identify compounds separated by paper chromatography, you can calculate the R_f (rate of flow) value for each dye using the formula below.

$$R_f = \frac{\text{distance traveled by dye}}{\text{distance traveled by solvent front}}$$

To maintain consistency, always measure from the pencil line marked at the bottom of the chromatography paper to the center of each spot. Record R_f values for each of the dyes.

Distance traveled by solvent front _____ cm.

Location from left	Name of dye or unknown	Sample color	Distance traveled by dye (cm)	R_f calculated
1				
2				
3				
4				
5				
6				
7				
8				
9				

Post-Lab Questions *(Use a separate sheet of paper to answer the following questions.)*

1. Calculate the R_f value for each dye in both the pure solutions and unknown mixtures. Record the results in the data table.
2. Identify the dyes present in the unknown mixtures. Include supporting data and reasoning for your conclusions.
3. Compare the R_f values of the pure dyes. Which pairs of dyes appeared to have very similar properties, based on their R_f values, despite their different colors?
4. Which food dye(s) had the greatest interaction with or affinity for the paper versus the solvent? Explain.
5. You are asked to mix an additional experimental unknown and want to make sure the mixture is a challenging one. Using observations and data from the completed experiment, develop a new three-dye component mixture that may be difficult to analyze. Explain why you chose this mixture.