

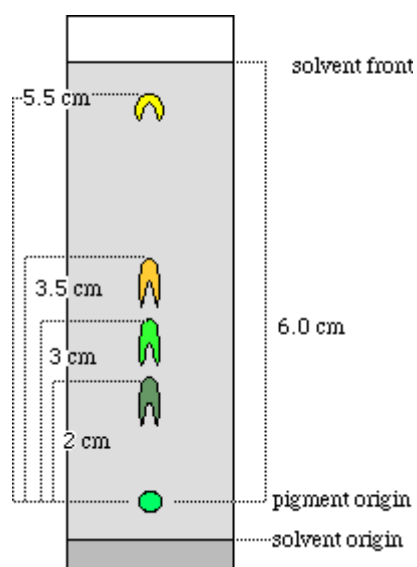
Paper Chromatography Rf Calculations

Name _____

Chromatography is a technique used to separate mixtures of compounds. In both thin layer chromatography (TLC) and paper chromatography a spot of pigment is put onto a chromatography plate or paper. The lower end of the plate or paper is put into a solvent. The solvent creeps up the paper (by capillary action) and slowly moves past the spotted mixture of pigments. Each pigment dissolves in the solvent or clings to the paper to different degrees. After a period of time the different pigments in the mixture end up spread out between the original spot and the upper most point reached by the solvent (called the solvent front).

The relationship of the distance moved by a pigment to the distance moved by the solvent front is specific for a given set of conditions. We call this relationship the retention factor (Rf) and define it as follows:

$$\text{Rf Factor} = \frac{\text{Distance the dye/pigment moves (pigment front)}}{\text{Distance the solvent moves (solvent front)}}$$



Thus, simple paper chromatography can be used to identify substances both **qualitatively** (by color) and **quantitatively** by its characteristic Rf value.

If the solvent front is 6 cm then the Rf value for the pigment at 3 cm would be 0.5. ($R_f = 3/6$)

If distance from the origin to solvent front is 6 cm, calculate the Rf factor for the 4 pigments illustrated above. Start with the pigment that rose the highest (5.5 cm). Show your work.

1	2
3	4