

## Coffee Filter Chromatography

### Materials Needed

- aluminum pie plate
- toothpicks
- pencil
- rubbing alcohol
- ink pens (“Expresso” work well)
- ruler
- pencil
- food coloring
- measuring cup (or graduated cylinder)

1. Use the pencil to make 8 evenly spaced marks about 1 cm from the outer edge of the coffee filter.
2. Place spots of the 4 food colors (fc), using 4 toothpicks, on 4 of the pencil marks. On the other 4 pencil marks, make spots with the 4 ink pens. Now allow the spots to dry.
3. So that you do not lose track of which spot is which, mark the source (green pen, blue fc...etc) with the pencil. There should be a pencil mark exactly where the ink or color spot starts.
4. Place this prepared coffee filter upside down on the pie plate.
5. Fill the pie plate with the rubbing alcohol so that the alcohol is just below the spots on the coffee filter.
6. Check your developing chromatogram every minute and carefully remove it from the plate/alcohol as soon as the alcohol travels to the top of the filter.
7. Mark the final distance the alcohol traveled.
8. Use the pencil to mark the end of the distance each color traveled.
9. Measure the distance traveled by the alcohol (mobile phase) in mm. You should measure from the beginning pencil mark to the mark you made in step 7.
10. Measure and record in mm the distance traveled by each of the colors in the inks or food colors. This distance is measured from the original pencil mark (step 2)
11. Calculate the Rf for each of the colors in each set of inks/food colors.

### Extensions:

You can try the same experiment with water color markers and water or with the “Expresso” markers and a mixture of water and alcohol.

### Helpful web sites:

<http://aa.uncwil.edu/reeves/onlinelabs/Paper%20Chromatography/PaperChromatIntro.html>

<http://chemlearn.chem.indiana.edu/demos/PaperChr.htm>

<http://www.woodrow.org/teachers/chemistry/institutes/1986/exp3.html>