THIN LAYER CHROMATOGRAPHY OF FOOD DYES

Introduction:
Thin layer chromatography is another fundamental type of chromatography. Separation occurs in the stationary phase by the mobile phase, like in any other chromatography. In this lab, the separation and identification of the dyes in food colors is performed. Then, by comparing plates and R_f values, the number of dyes used in the food colors can be determined.

Purpose:
The purpose of this lab is to identify the dyes using thin layer chromatography.

Equipment / Materials:

food dyes (McCormick assorted)	100 mL beaker
1% sodium chloride solution	TLC plates
toothpicks (round)	250 mL beaker
standard FD&C food colors	ruler

Safety:
- Always wear safety glasses in the lab.

Procedure:

1. Place several drops of each color of food dyes in separate wells on a spot plate.
2. Using a toothpick, place a small dot of the desired color about 1/2 inch from the bottom of the plate. It is important to make the spots very small. Usually one touch with a toothpick is sufficient.

3. Repeat until all 4 colors are spotted separately across the bottom of the plate.

4. Place a thin layer of 1% sodium chloride solution in the bottom of the 100 mL beaker.

5. Place the spotted plate in the beaker, spotted end down, leaning it on the side of the beaker (spots must remain above solvent level).

6. Cover with the 250 mL beaker.

7. Allow the solvent to rise to near the top of the plate.

8. Remove plate from solution.

9. Determine R_f values.

10. Determine which colors are mixtures.

11. If standard dyes are available, spot a plate with the ones you believe are contained in a mixed food color. Spot the food color on the same plate. Then spot the food color on top of a new spot of standard dye. Determine if the dyes are the same compound.

Data Table:

Dye	Rf
Blue	
Red	
Yellow	
Green	
Yellow 5	
Red 40	
Blue 1	
Red 3	

Questions:

1. What is the purpose of covering the plate with a 250mL beaker (step 6)?

2. Why is an Rf value necessary to identify a substance on a chromatogram and not just the distance the spot moved?

3. Why does one component of a mixture move further up the plate than another?