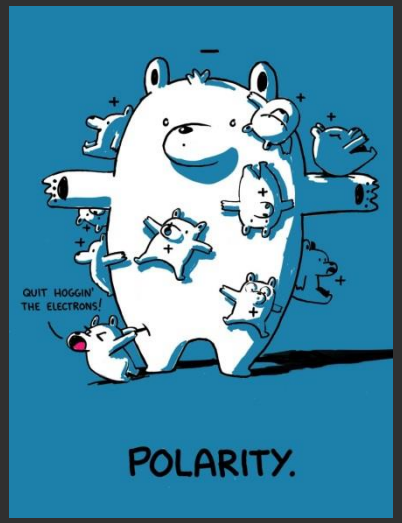
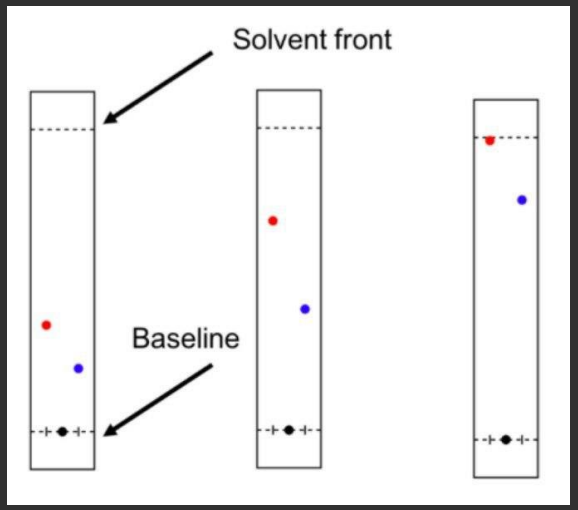
Practical pharmacognosy
Second stage

Al- Nahrain university
College of pharmacy

EFFECT OF SOLVENT POLARITY ON RF VALUES

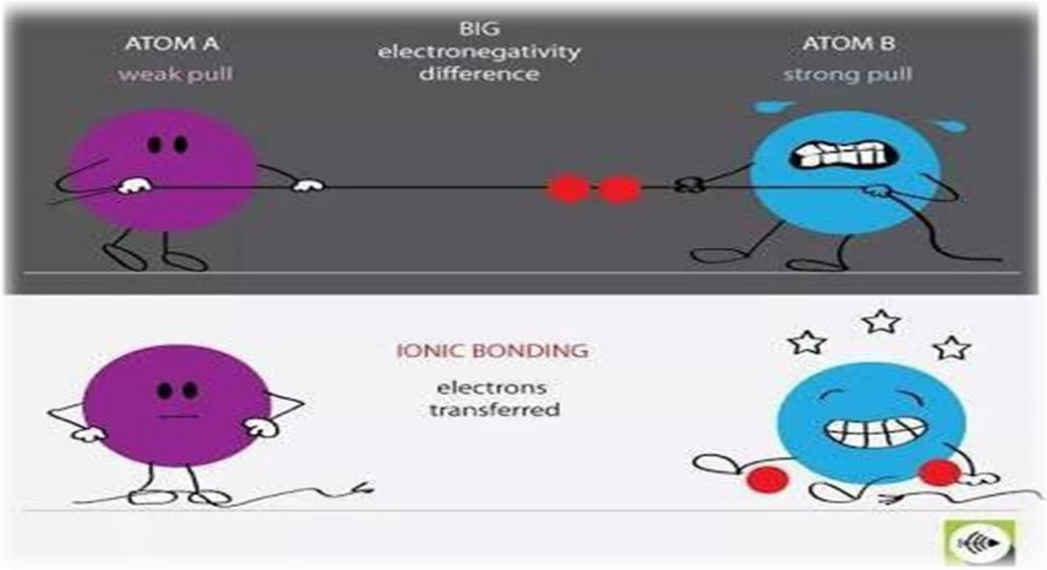




Lab 6

What is polarity ?

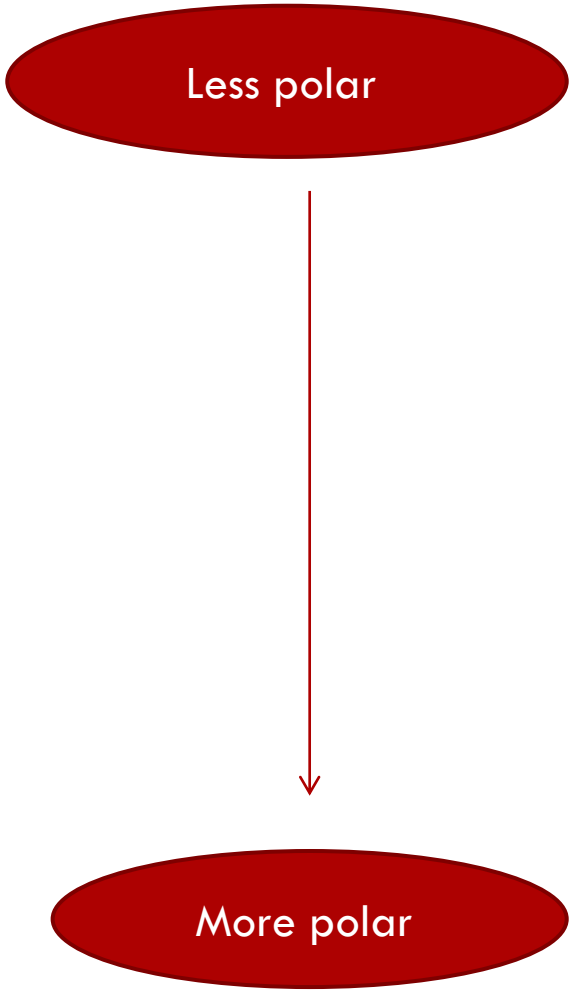
- It is the distribution of electrical charge over the atoms joined by the bond.



- Solvents classified as polar and non-polar , Nonpolar chemicals are considered lipophilic (lipid-loving), and polar chemicals are hydrophilic (water-loving).

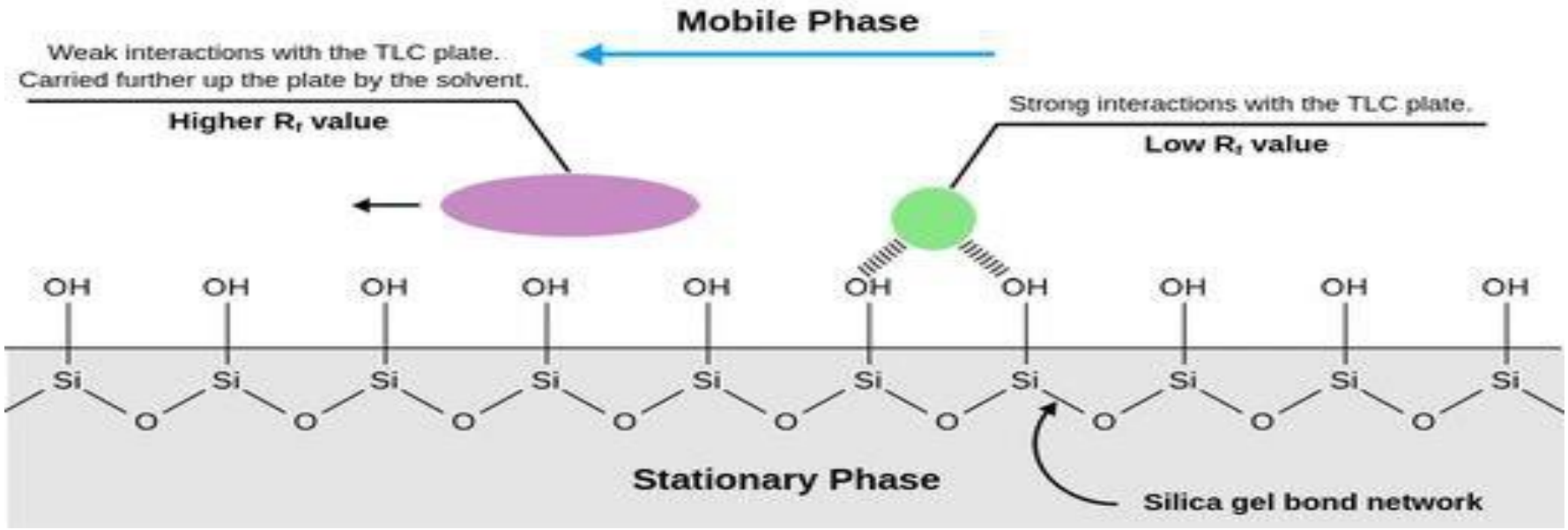
- As like dissolve like, polar substances dissolve in polar solvents and non-polar substances dissolve in non-polar chemicals.
- There is an index to find the polarity called polarity index. If the polarity index is less the substance is non-polar and if the index is high the substance is more polar .

Solvent	Solvent Polarity Index, *P*
Hexane	0.1
Carbon tetrachloride	1.56
Isopropyl ether	1.83
Toluene	2.4
Methyl-*t*-butyl ether	2.4
Chloroform	2.7
Diethyl ether	2.8
Dichloromethane	3.1
Isopropanol	3.92
Tetrahydrofuran	4.0
Ethyl Acetate	4.4
Methanol	5.1
Acetone	5.1
Dioxane	5.27
Acetonitrile	5.8
Water	10.2



- The chromatogrphy contain main three part : the stationary phase (adsorbent) , mobile phase (eluent) and **the sample** .
- The stationary phases (silica gel or aluminum oxide) are usually **very polar** , while mobile **phases vary widely in polarity** , but are less polar than stationary phase .

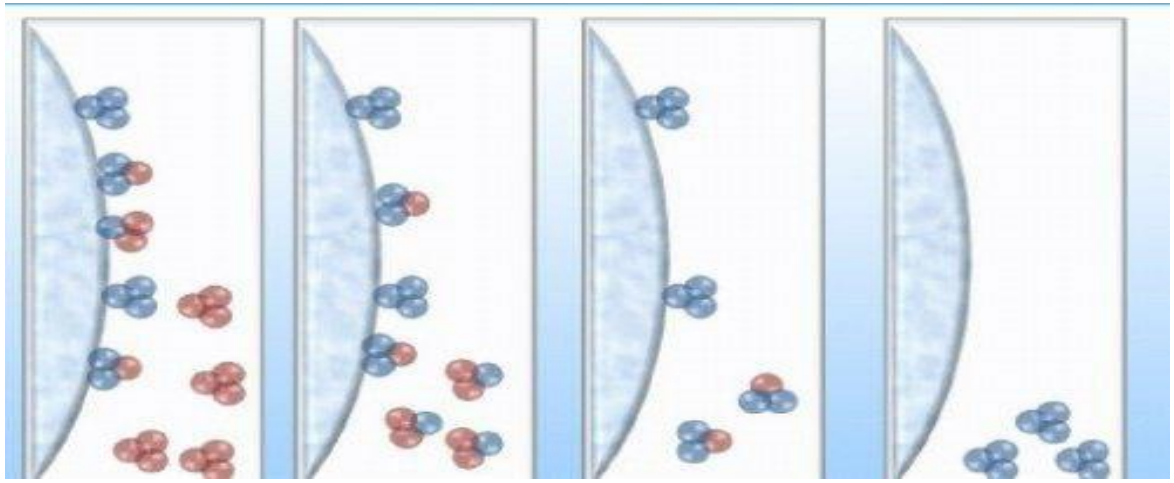
- the sample either adsorbs to the stationary phase or is eluted by the mobile phase (eluent). If the **eluent is very polar relative to your compound**, it will **dissolve your sample and the sample will move with the mobile phase.**



- the eluent and your sample will compete for a **space (an active site) on the adsorbent (stationary phase)** coated on the TLC plate. **The more polar compound will win this competition and adhere (adsorb) to the adsorbent,** while **the rest of the mixture will move.**

Less polar

More polar



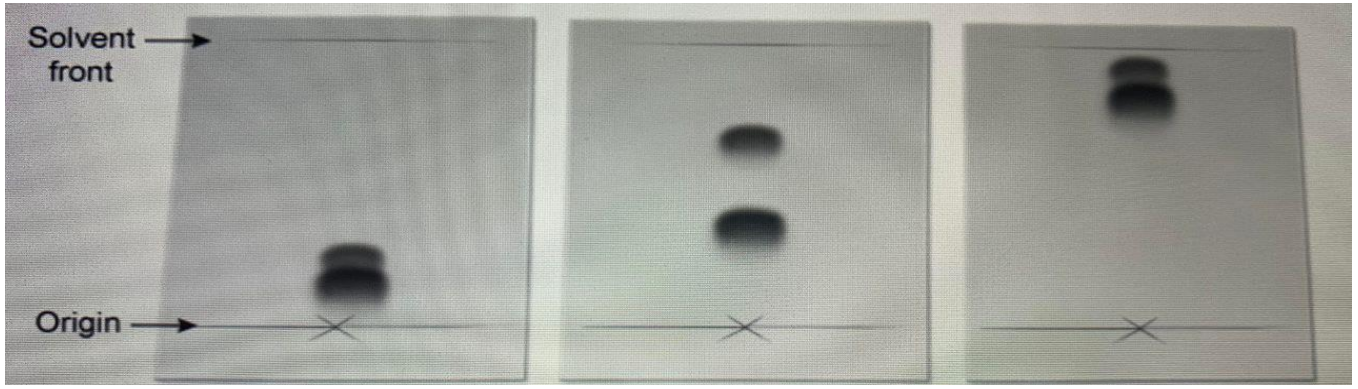
Experiment N0.3

- Aim : **to determine the effect of solvent polarity on RF value**
- **Procedure:**

1. Prepare mobile phase (toluene : ethyl acetate 2:1) , and place it in the glass jar .
2. Activate silica plate at oven for 2 minutes , then draw the base line .
3. Apply the sample spot on the silica gel plates , on the base line by the use of capillary tube. **(the sample is the same sample used in the last lab , Harmala extract)**
4. Put the silica gel plate in the glass jar and allow the mobile phase to rise to about two-third the plate.
5. Remove the plate from the jar, draw front line then dry
6. Spray the plate with spraying reagent (Dragendorff's reagent) and then calculate the Rf values.
7. Compare the RF values in this mobile phase **(toluene : ethyl acetate)** with the RF values in the last lab **(mobile phase ; chloroform : ethanol : acetone)** .

Important notes

- If the spot is observed to be too close to the baseline, your eluent is not polar enough. If the spot is observed to be too close to the solvent front, your eluent is too polar in relation to your compound .



- The best Rf (retardation factor) lies between 0.3 and 0.7.


THANK
YOU