



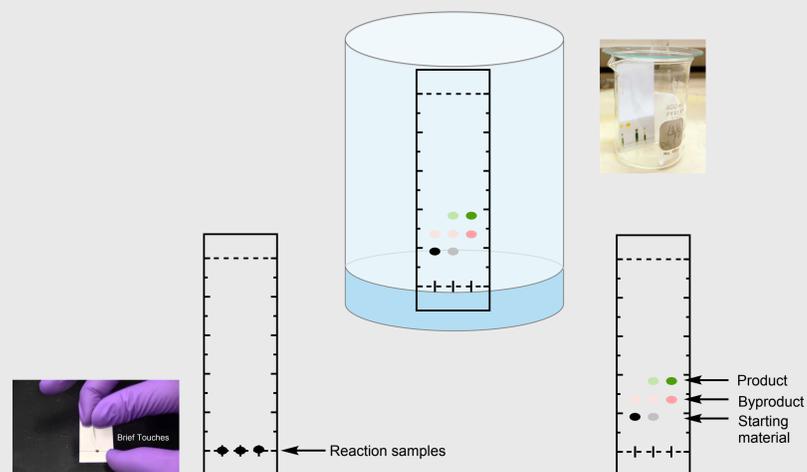
1. Design



- Elaborate a synthetic pathway
- Go to the library (or webpages like REAXYS) and see what has been done before
- The starting materials (blue and yellow) reacting under formation of the desired product (green)

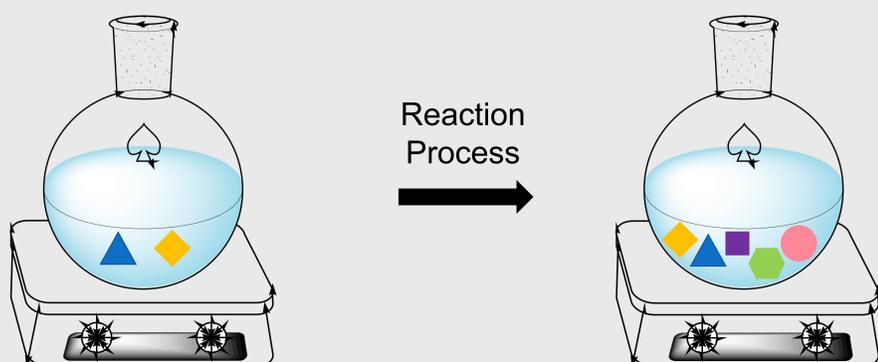


3. Monitoring the Reaction



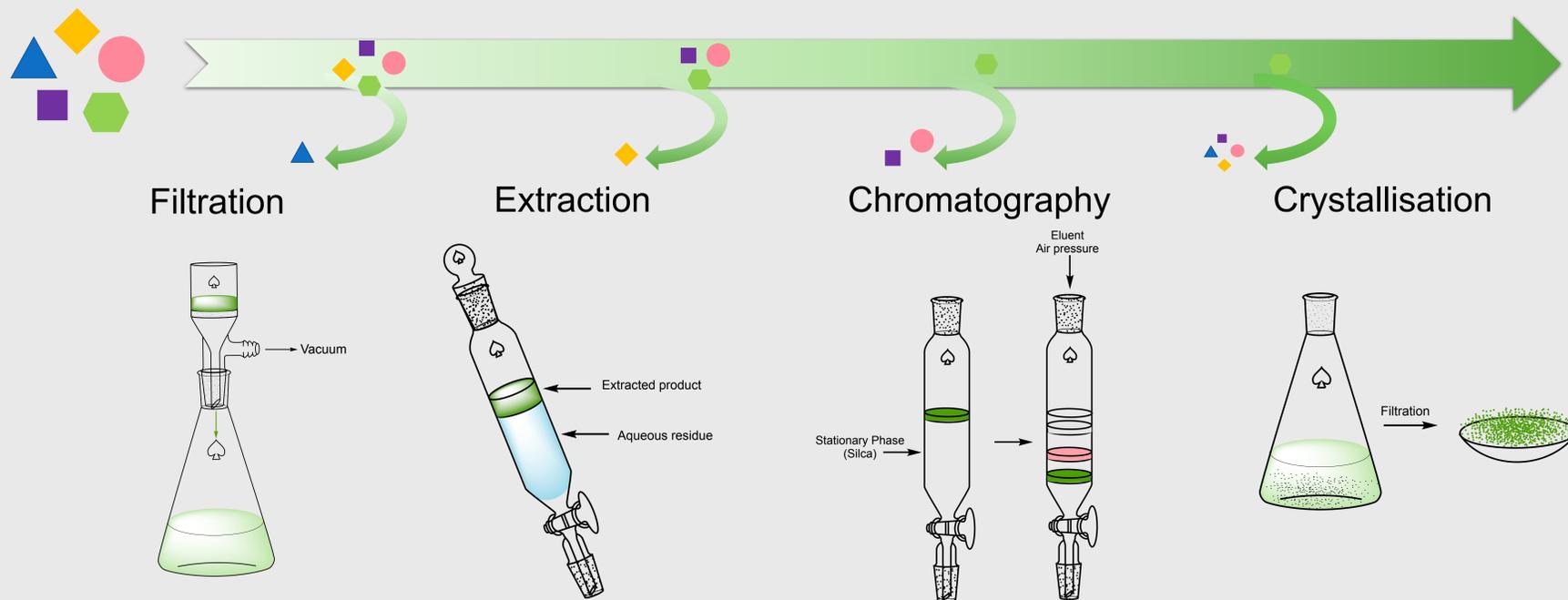
- Track the reaction progress over time
- Take small samples out of the running reaction
- With a pipette, put the samples on the TLC (thin-layer chromatography) plate
- Put TLC plate in eluent (mixture of solvents)
- The starting material, byproducts, and product will have different 'running times'
- When the spot for the starting material is gone, the reaction can be stopped

2. Reaction



- Setup the reaction in a flask
- Figure out the right conditions (temperature, solvent...) for the reaction

4. Isolation and Purification



- After stopping the reaction, the mixture is filtered
- Usually glass funnels with very small diameter
- For the removal of undesired molecules
- The solvents with the diluted product flush a lot faster through the filter when vacuum is applied to the setup

- In a closed extraction funnel, the product, diluted in an organic solvent, is extracted with water
- This is to remove salts and other water-soluble byproducts
- This works, because most organic solvents are not soluble in water, so it is a 2-phase system

- As seen on the TLC plate, product, byproducts, and starting material run at different speeds
- A column chromatography is basically a preparative TLC
- The molecules interact differently with the stationary phase which allows a separation

- The product, which was separated before is now diluted in a solvent
- It should be a solvent which the compound is not perfectly soluble in
- It is heated and while cooling down, the product crystallises out
- Gives very pure sample

5. What is the appeal of being a chemist?

- You are able to make new molecules, no one else has ever done before and you are basically 'manipulating' nature on a less than 1 nm scale
- You are being challenged and learn something new every day

