

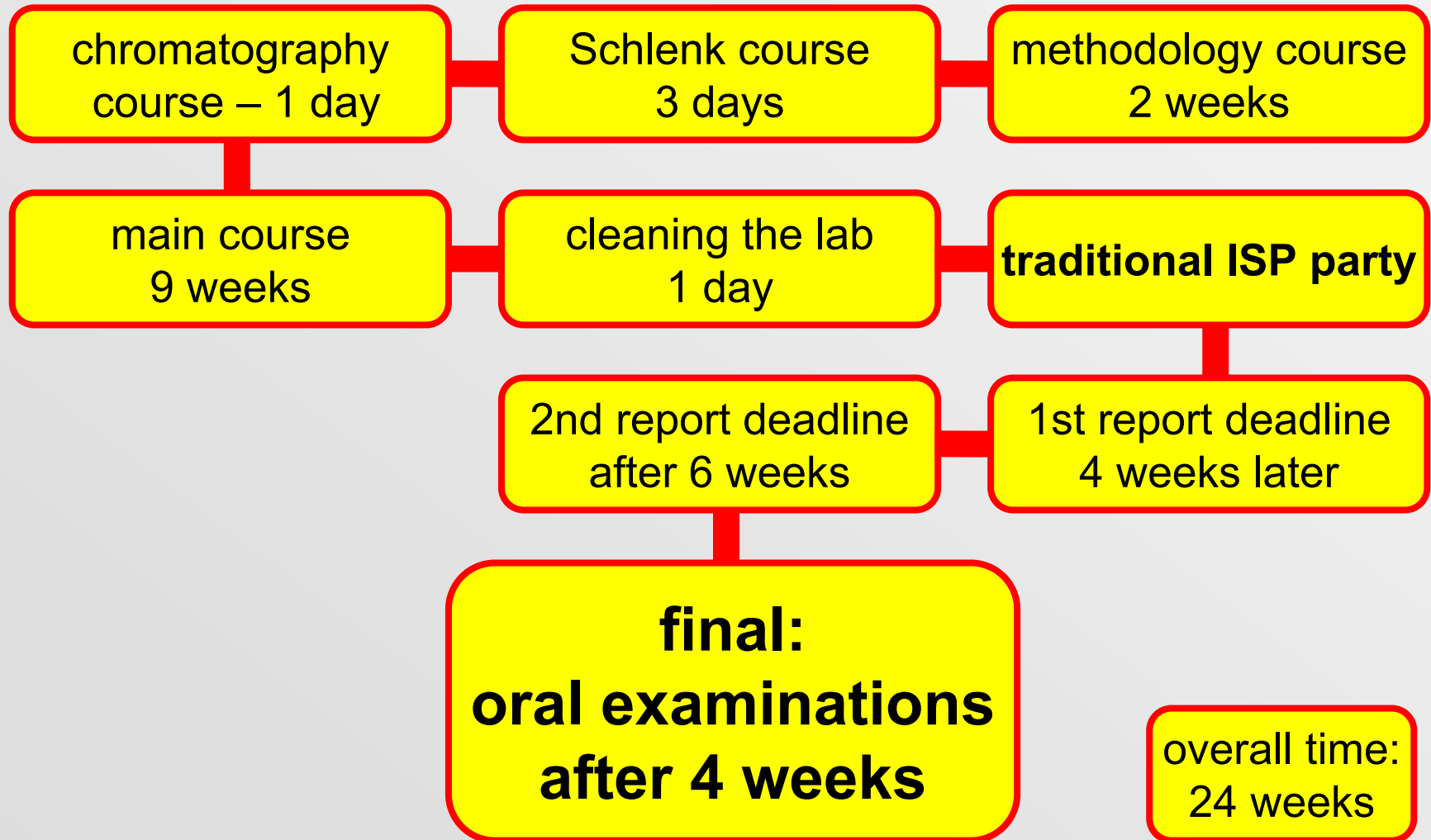
The Integrated Synthesis Course (ISP)

A third year practical course of synthetic inorganic and organic chemistry in Hamburg



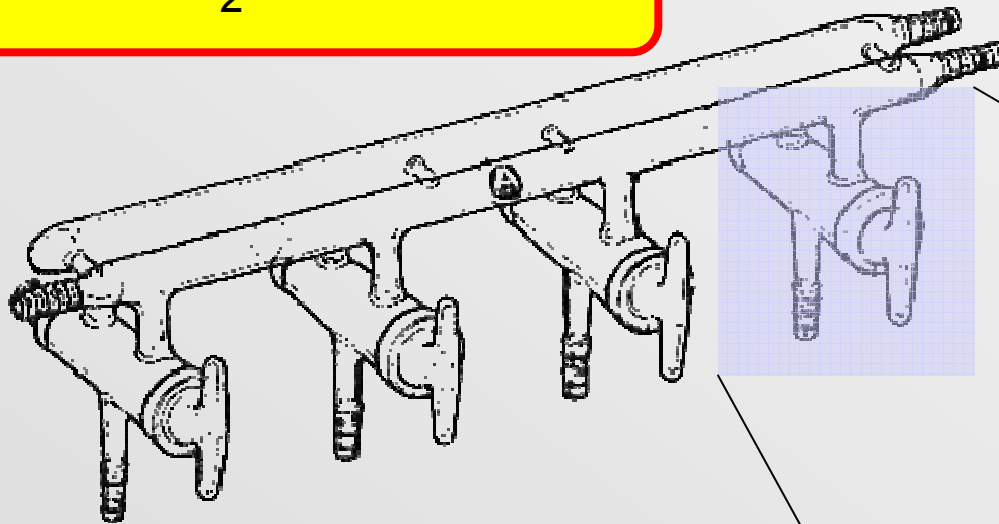
Universität Hamburg

Schedule of the ISP



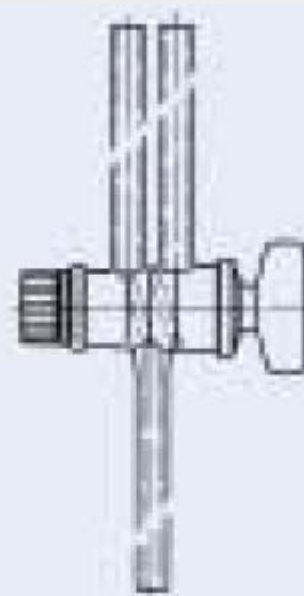
Equipment needed for Schlenk technique

combined N₂-vacuum line

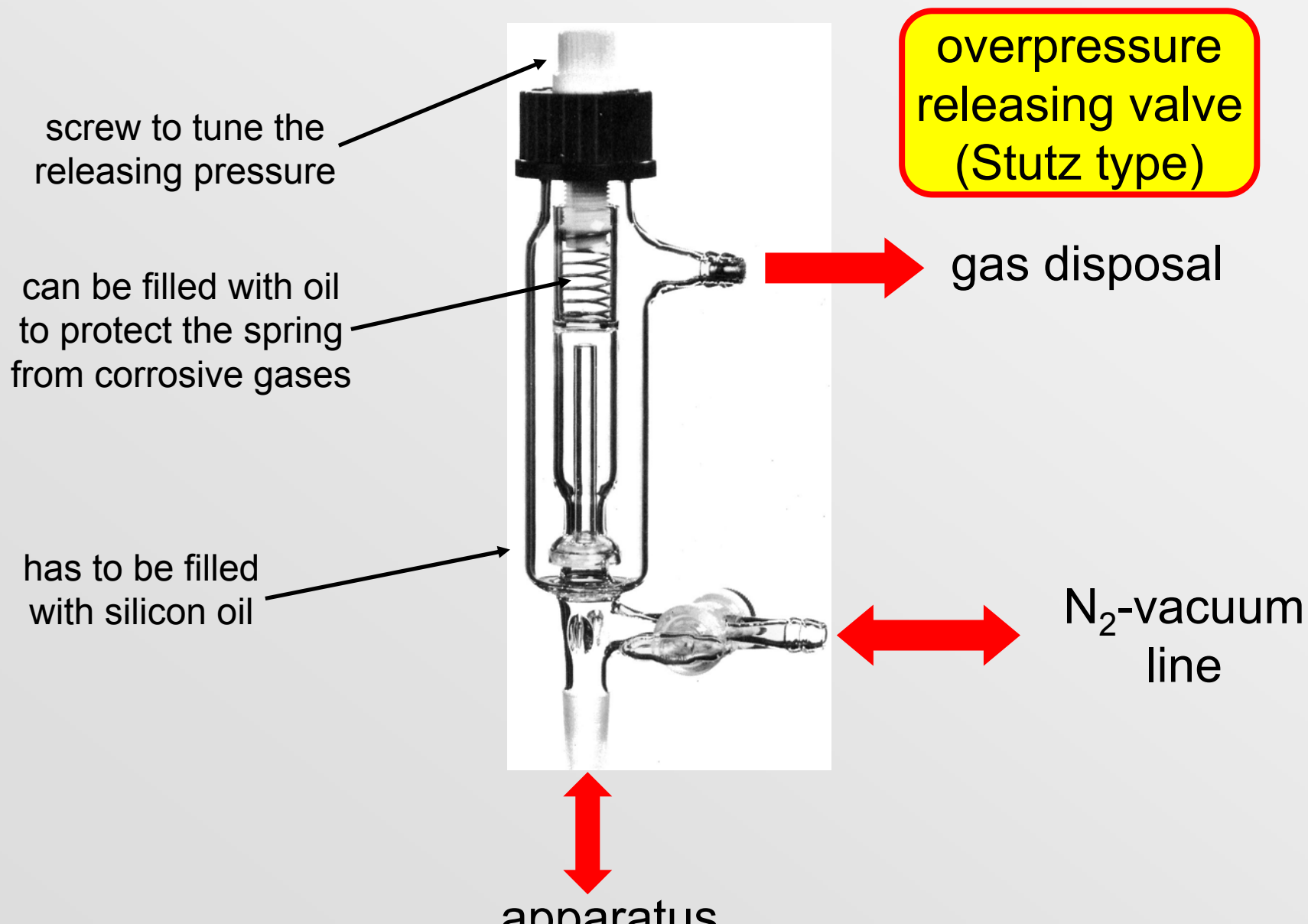


„Schlenk rake“

valves, two ways,
expensive

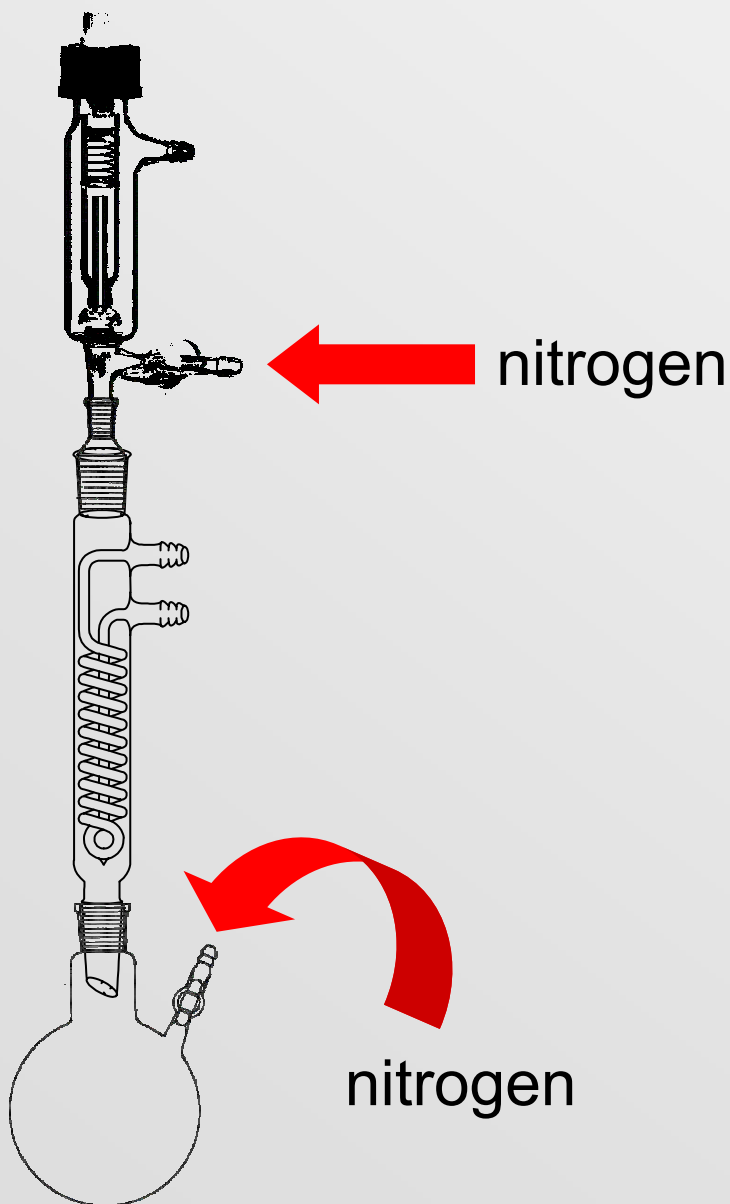


Equipment needed for Schlenk technique

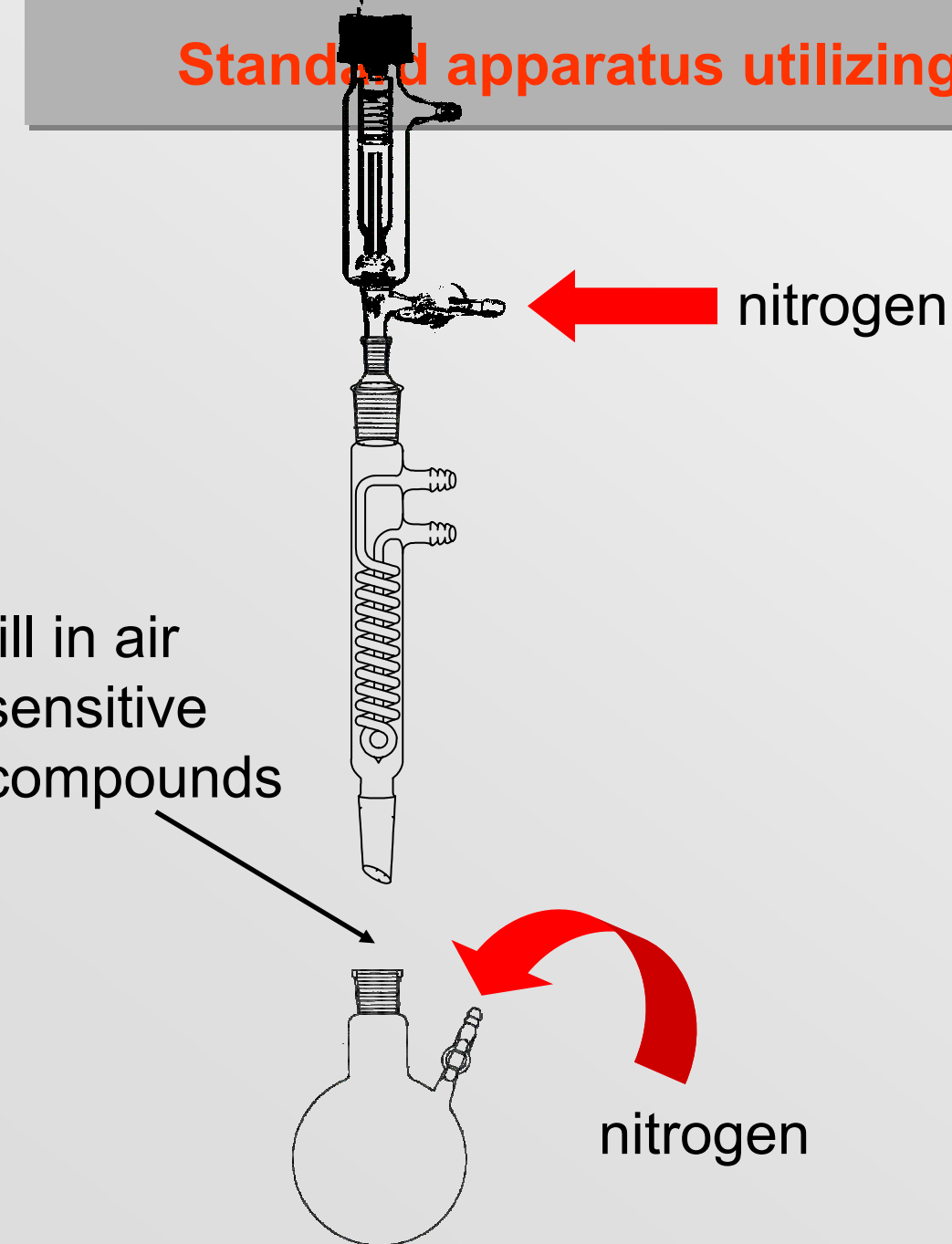


Standard apparatus utilizing Schlenk technique

simple reflux apparatus



Standard apparatus utilizing Schlenk technique



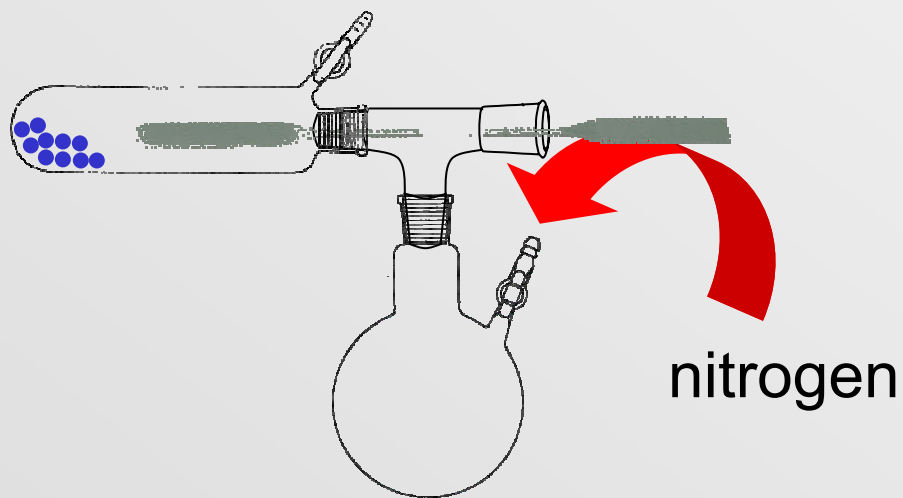
simple reflux apparatus

apparatus stays under inert gas atmosphere!

the reflux condenser can be substituted for a dropping funnel, for example.

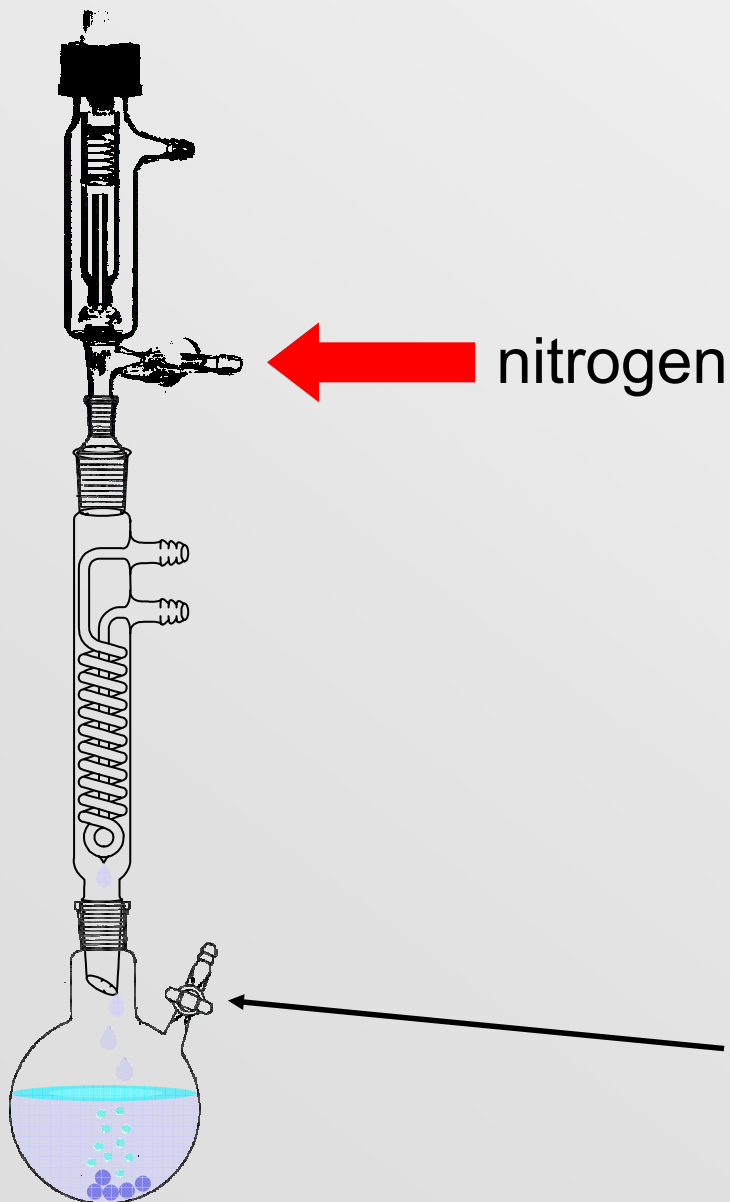
Standard apparatus utilizing Schlenk technique

transfer of
compounds



Standard apparatus utilizing Schlenk technique

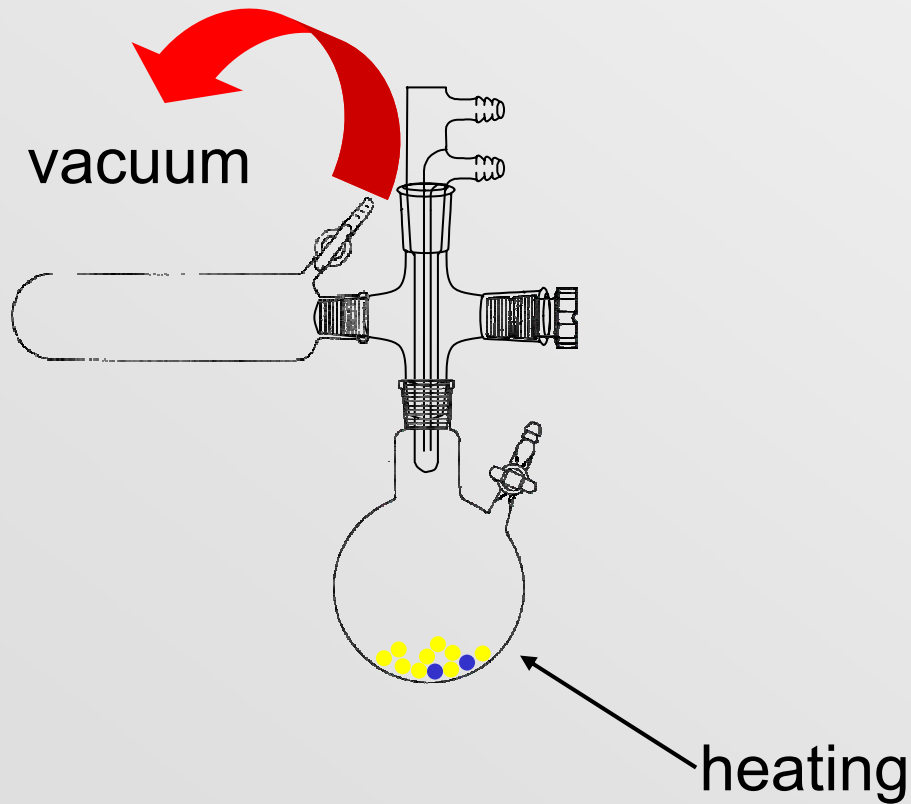
simple reflux apparatus



close this valve for refluxing

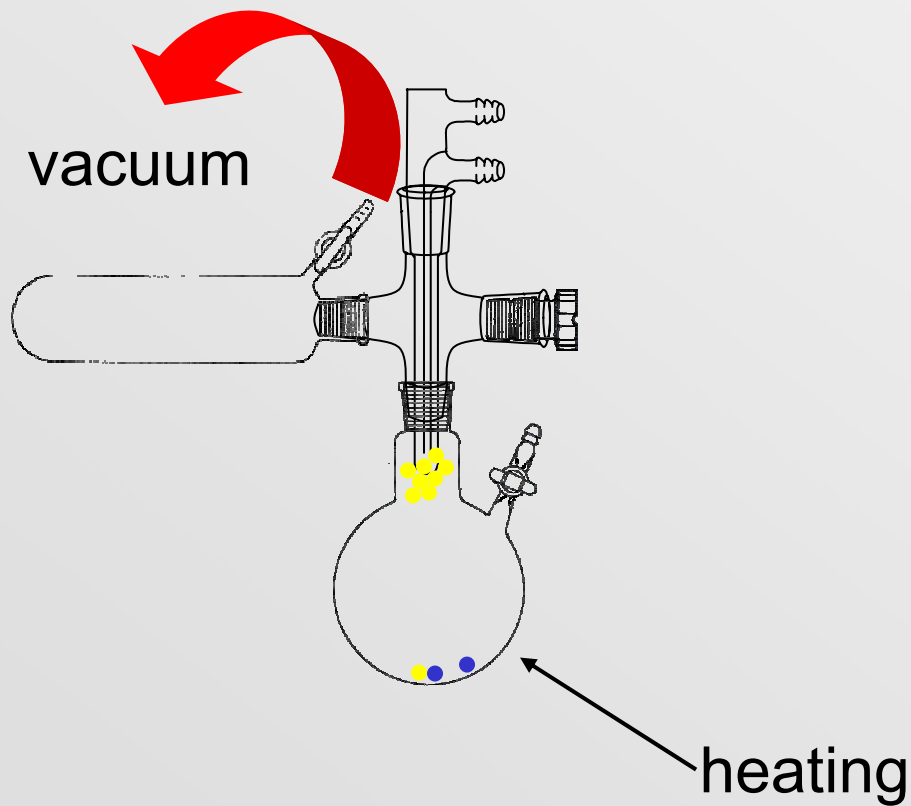
Standard apparatus utilizing Schlenk technique

sublimation
apparatus

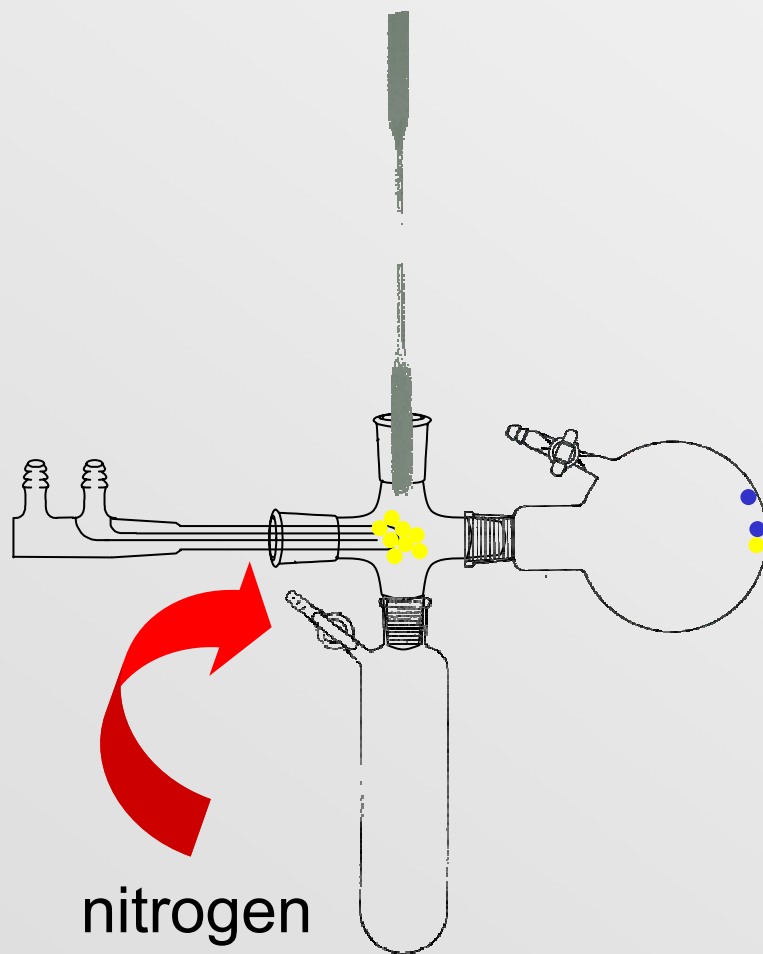


Standard apparatus utilizing Schlenk technique

sublimation
apparatus



Standard apparatus utilizing Schlenk technique

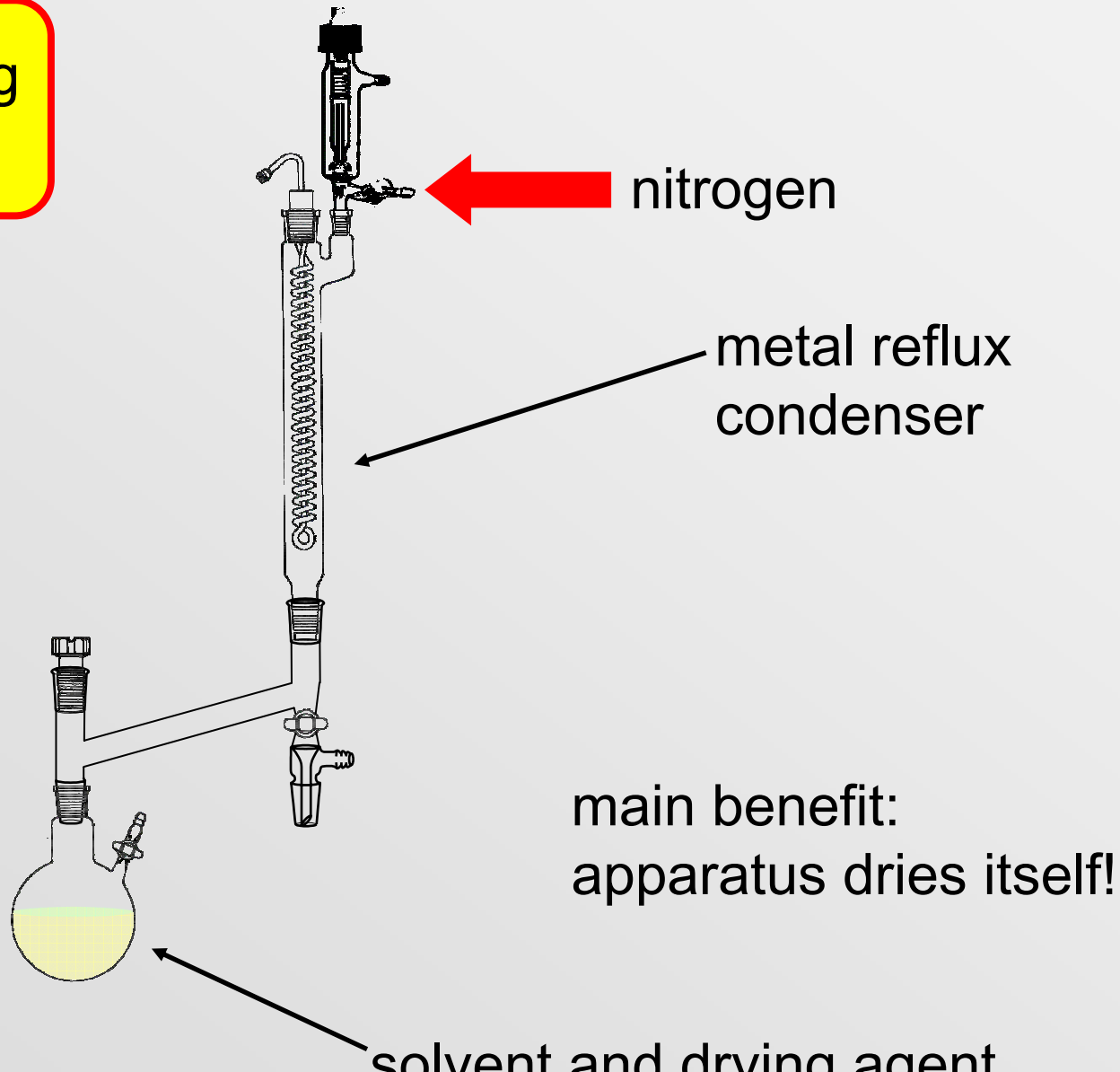


sublimation
apparatus

use a spatula
to scratch off
the crystals...

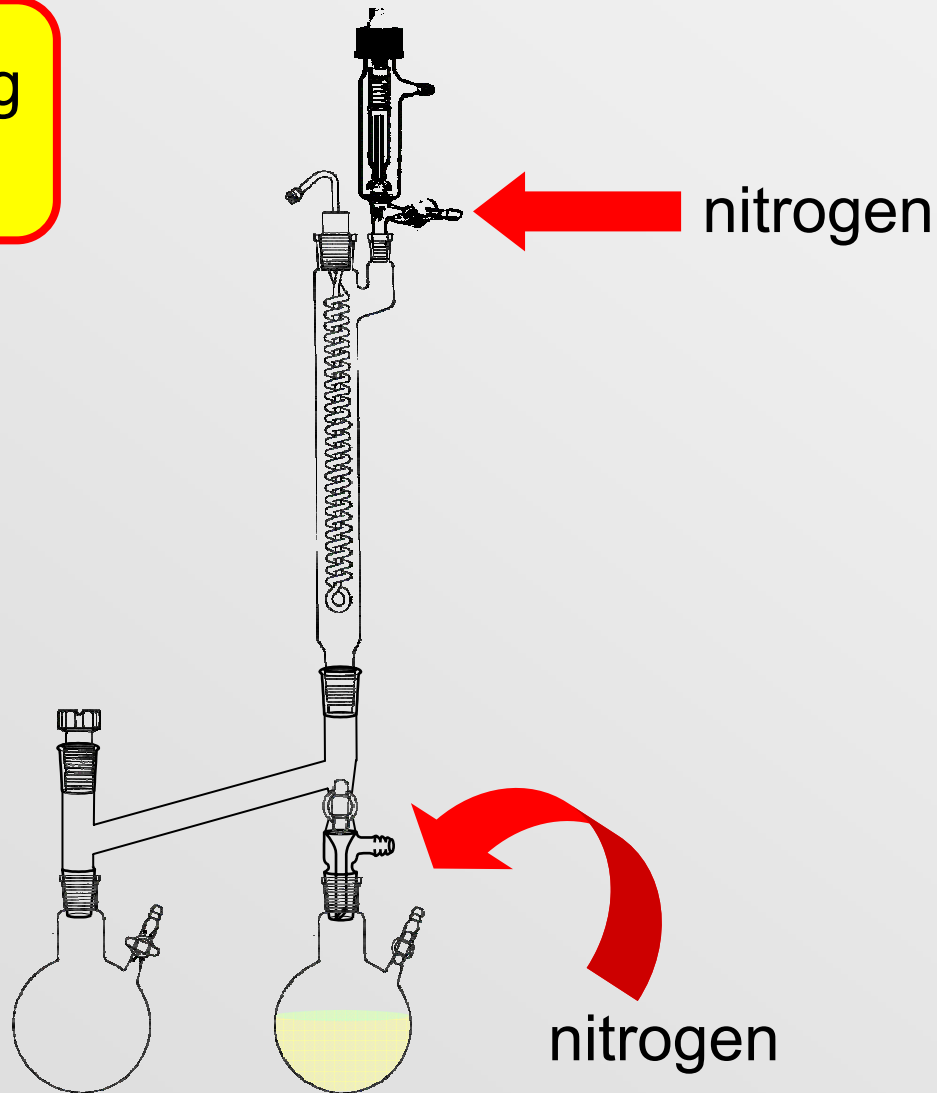
Standard apparatus utilizing Schlenk technique

solvent drying
apparatus



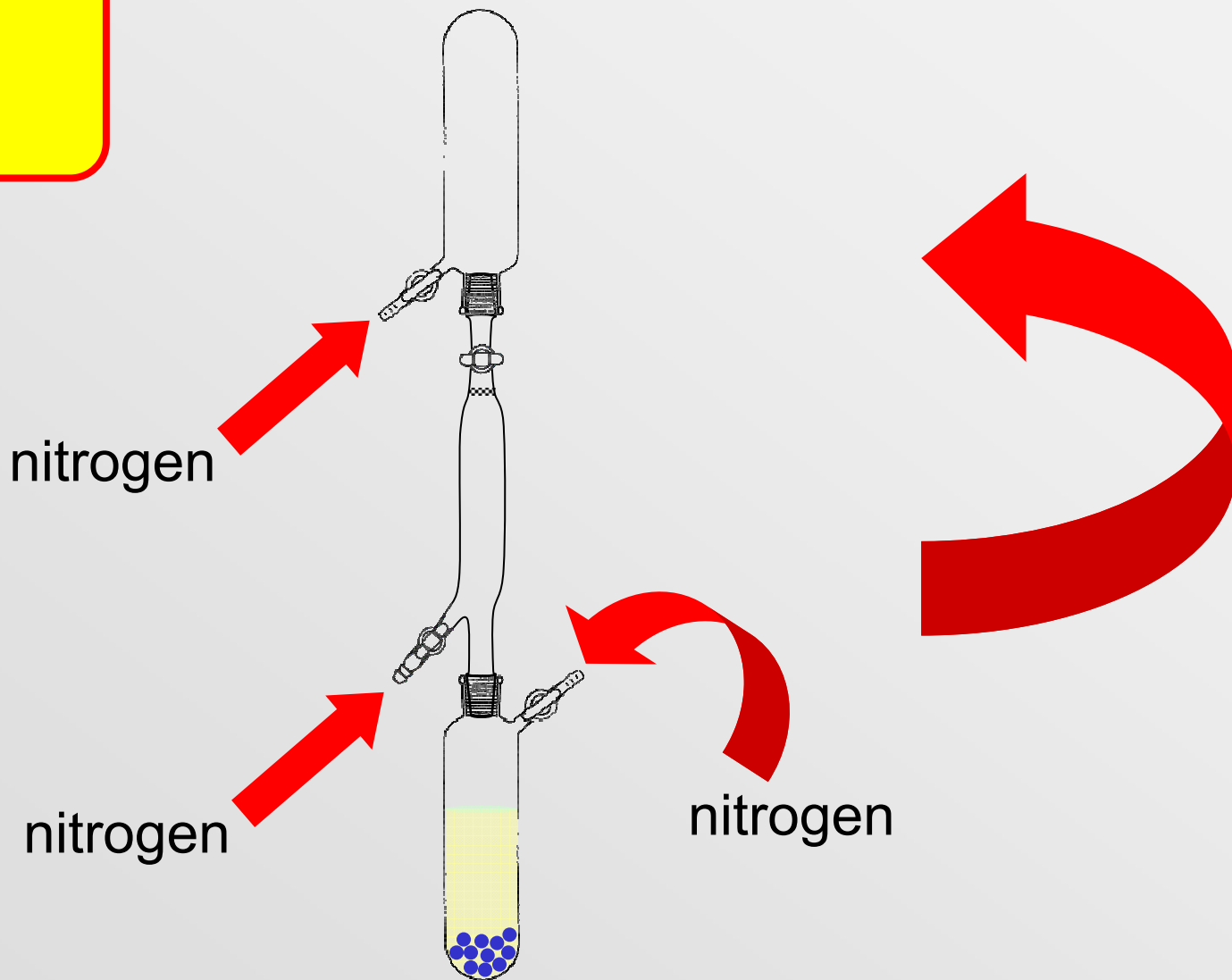
Standard apparatus utilizing Schlenk technique

solvent drying
apparatus



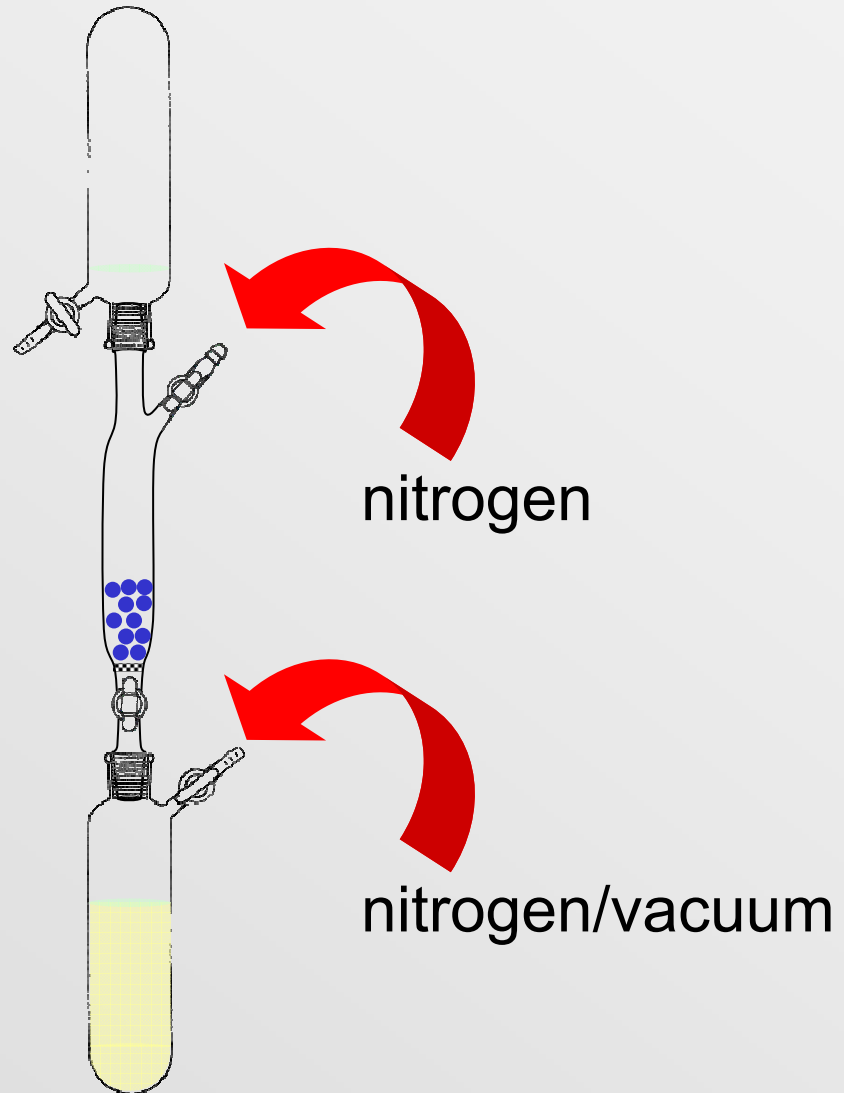
Standard apparatus utilizing Schlenk technique

filtration



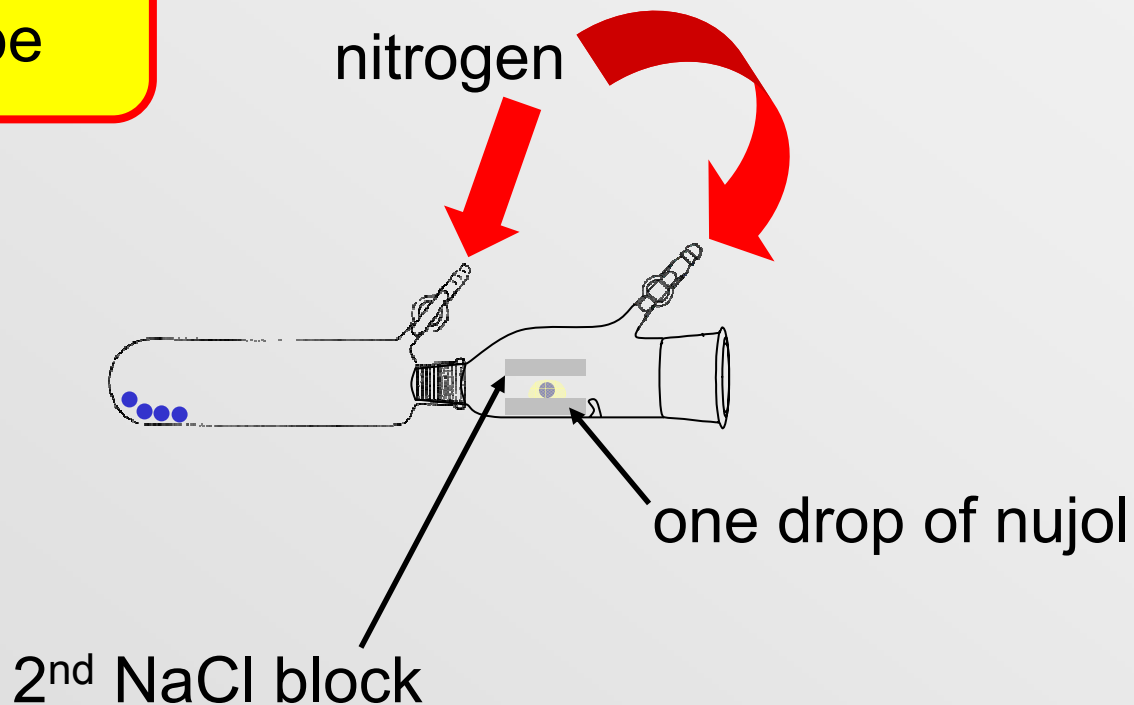
Standard apparatus utilizing Schlenk technique

filtration



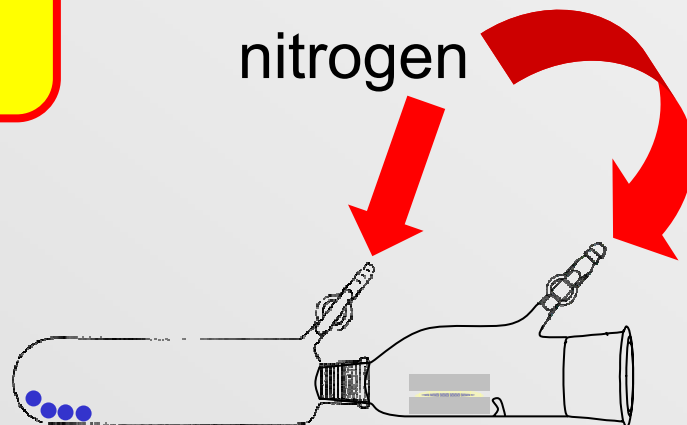
Standard apparatus utilizing Schlenk technique

preparing an
IR probe



Standard apparatus utilizing Schlenk technique

preparing an
IR probe

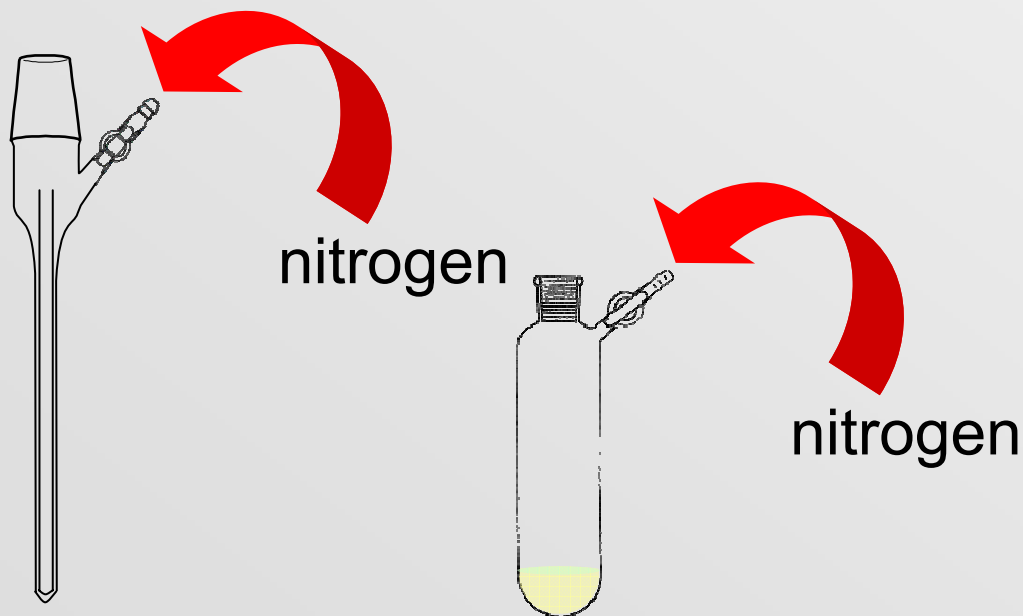


Press together and
grind!

Standard apparatus utilizing Schlenk technique

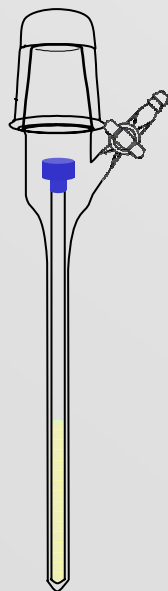
preparing a
NMR probe

Transfer the solution with a
syringe or a pasteur pipette

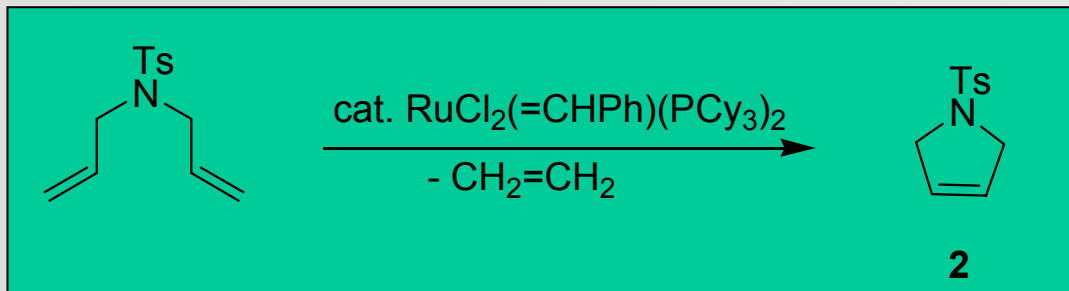
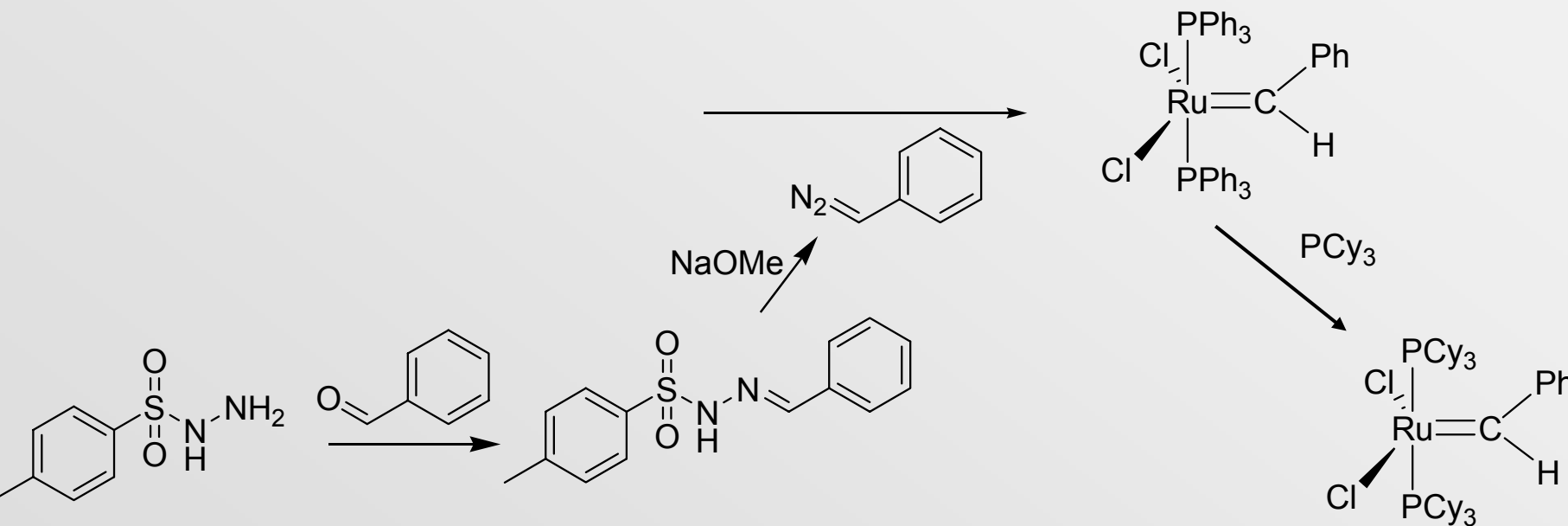
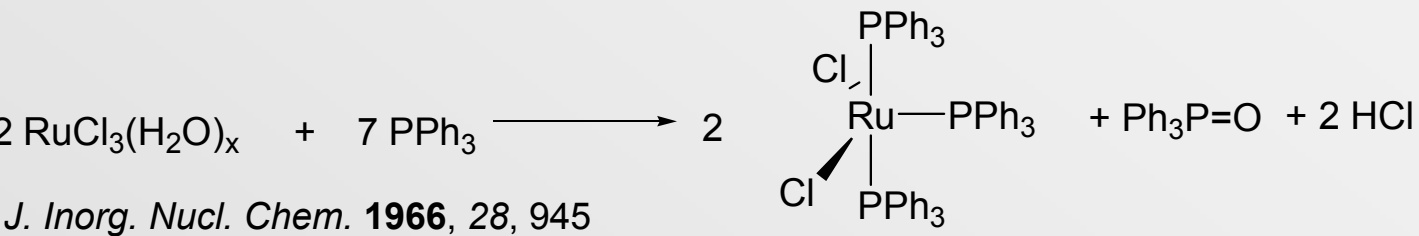


Standard apparatus utilizing Schlenk technique

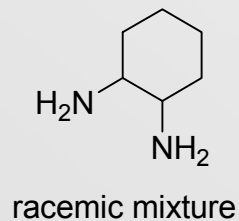
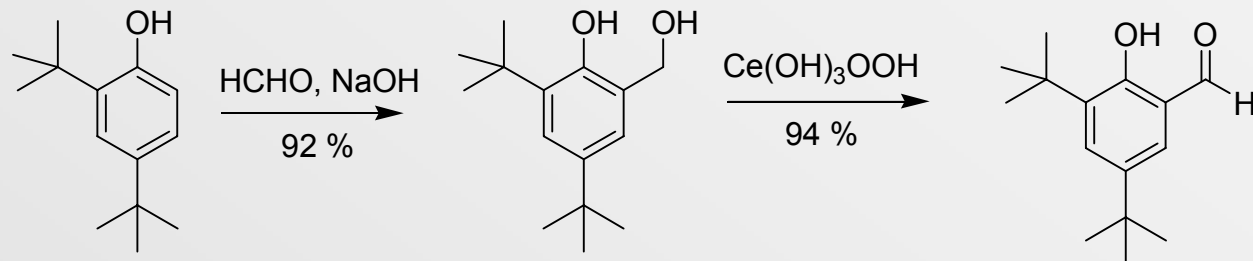
preparing a
NMR probe



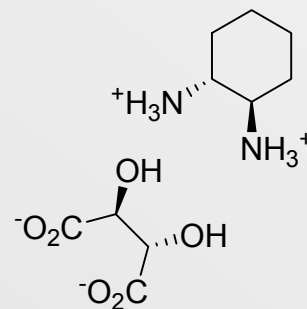
Olefin Metathesis



Jacobsen Epoxidation

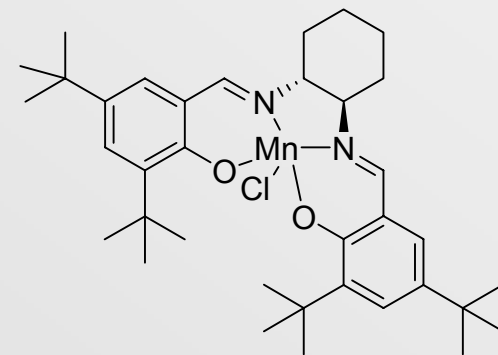


(+)-tartaric acid

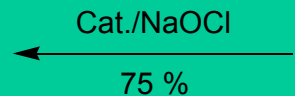
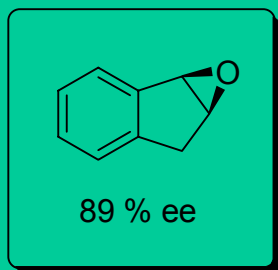


1. $\text{Mn}(\text{OAc})_3 \times 2\text{H}_2\text{O}$,
TEA
2. NaCl

83 %

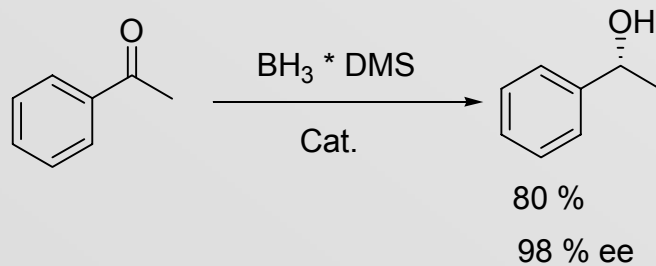
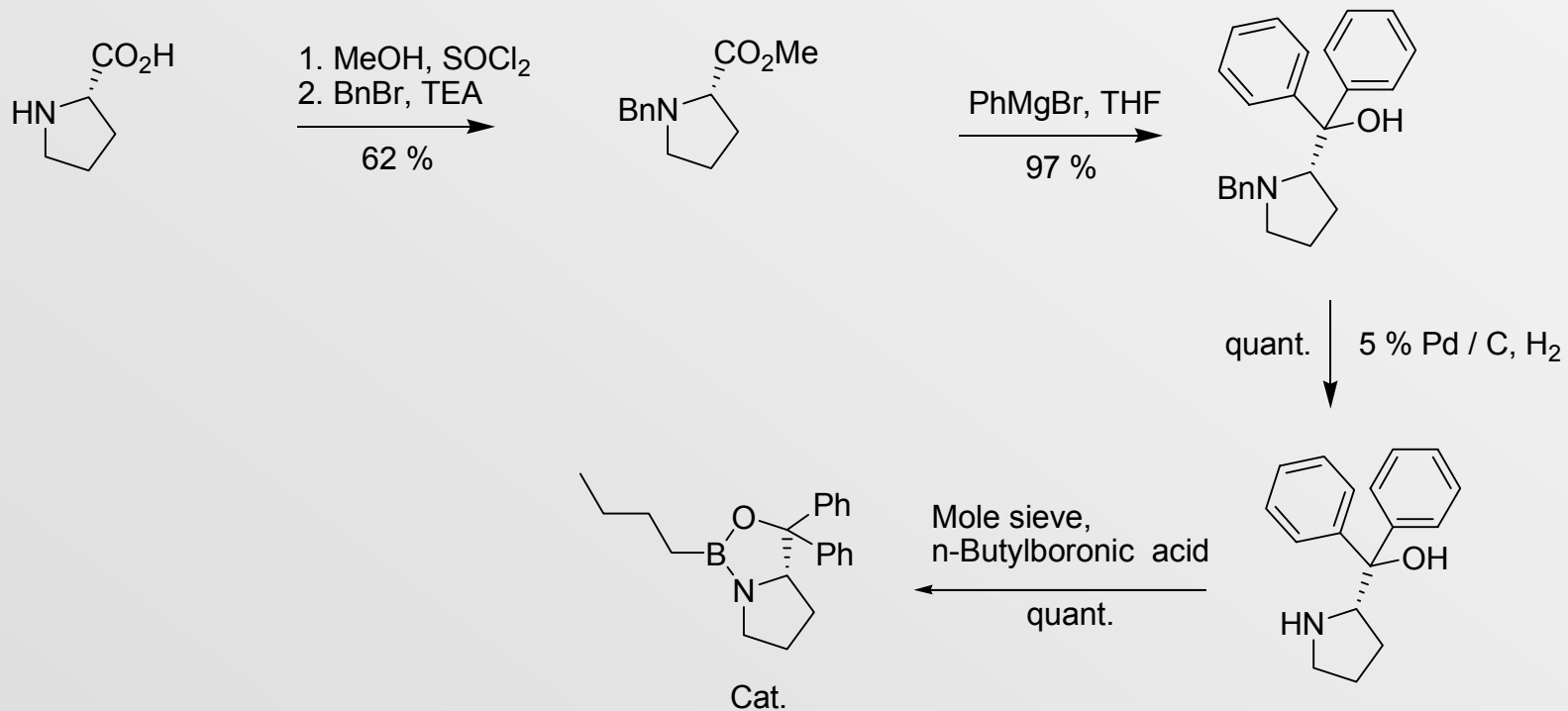


Cat.

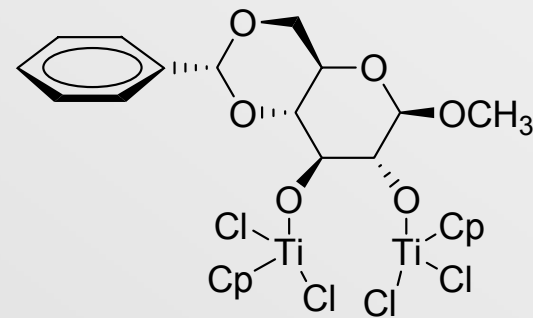
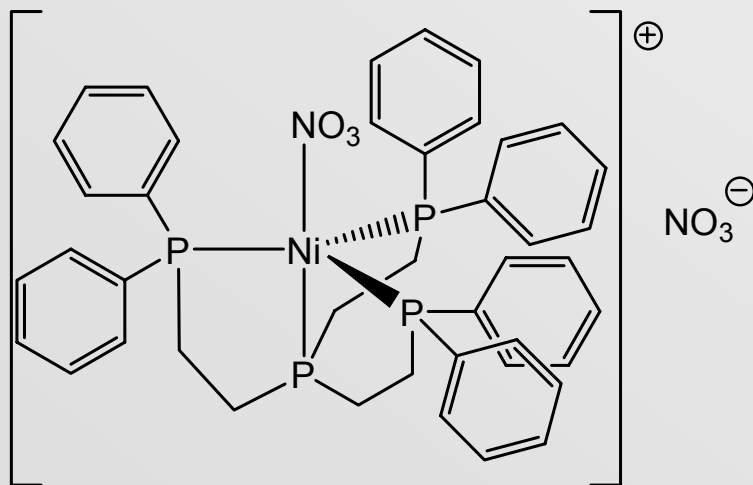
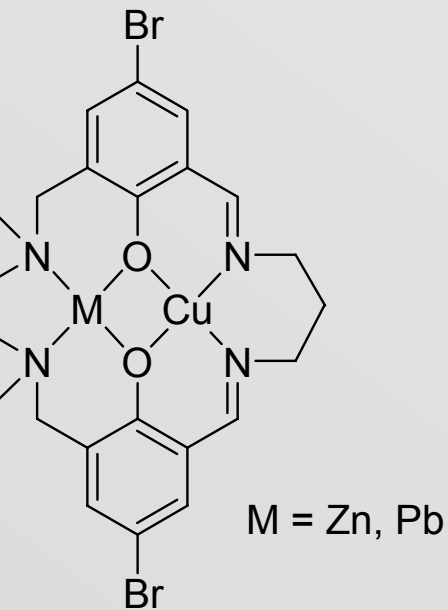
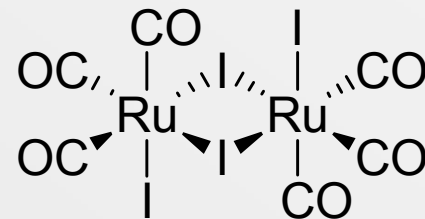
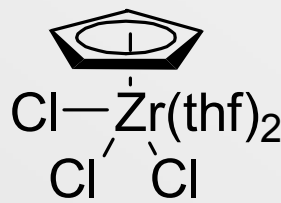
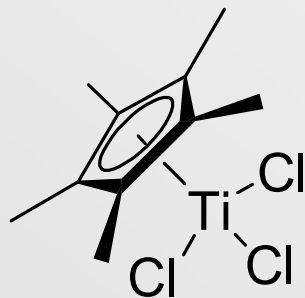
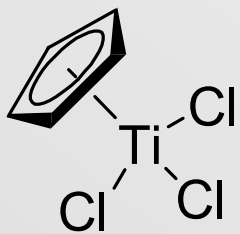


Synth. Commun. **2001**, *31*, 2913;
Chem. Rev. **2003**, *103*, 2457

CBS Reaction



Typical OM compounds prepared in the ISP



Typical organic compounds prepared in the ISP

