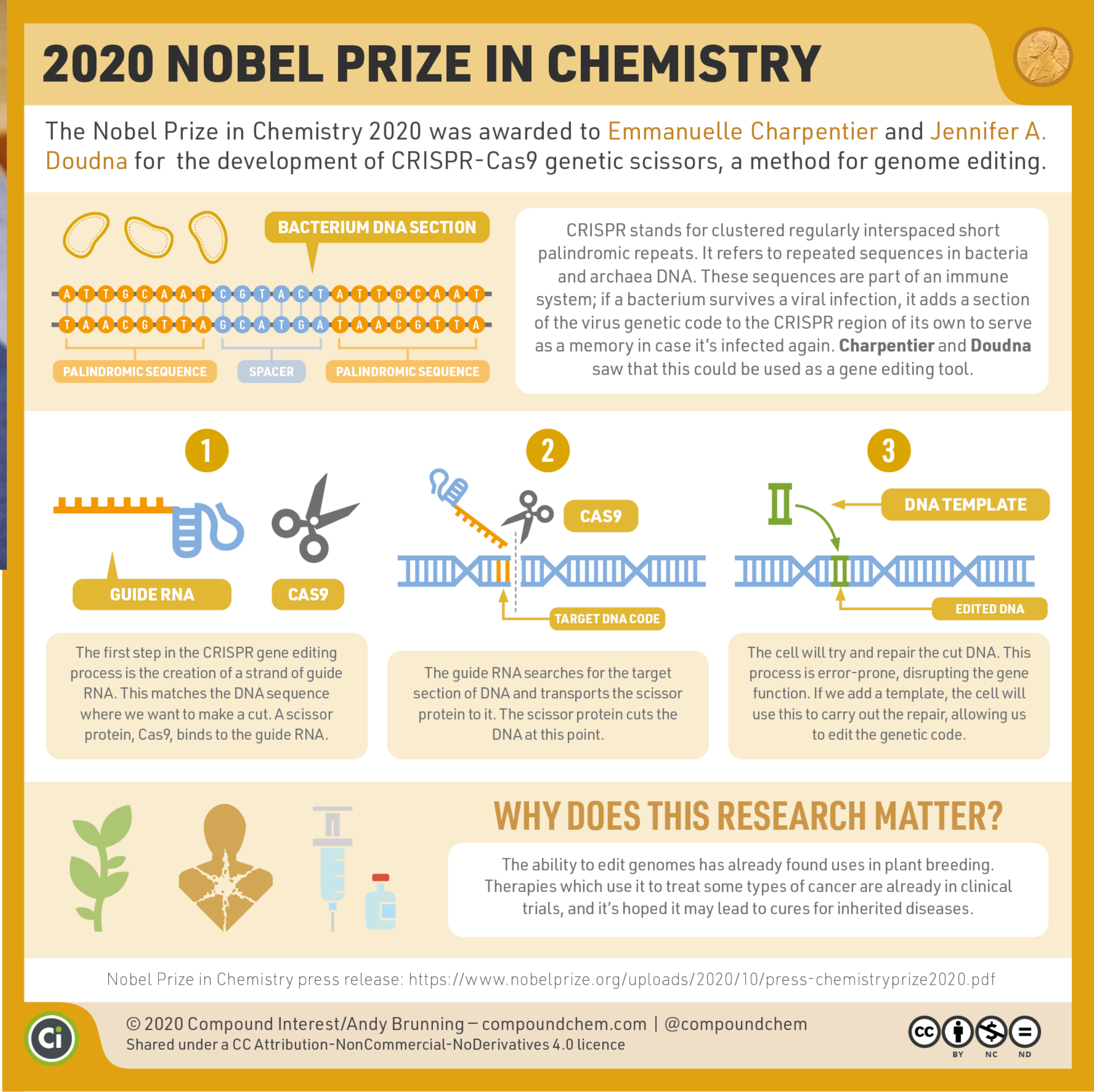
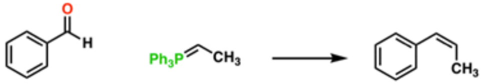
How to win a Chemistry Nobel prize?



A

*1979*

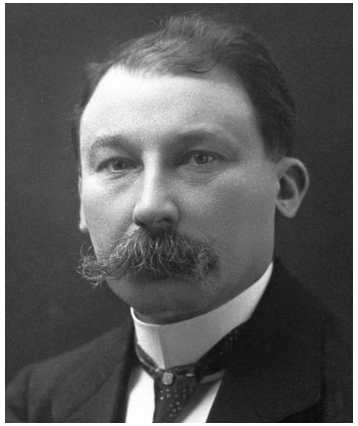
*Wittig*

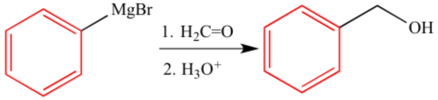



B

*1912*

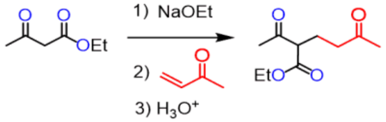
*Grignard*






C

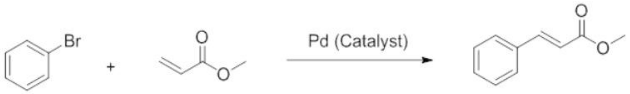
*Michael*




D

*2010*

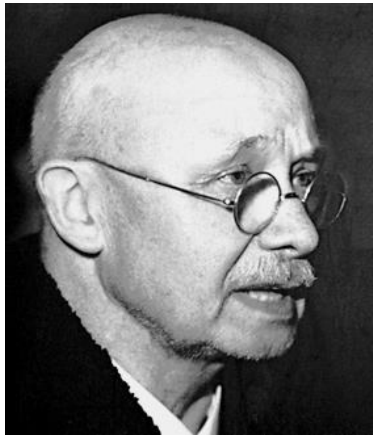
*Heck*

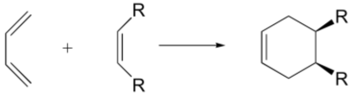



E

*1950*

*Diels*

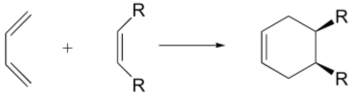


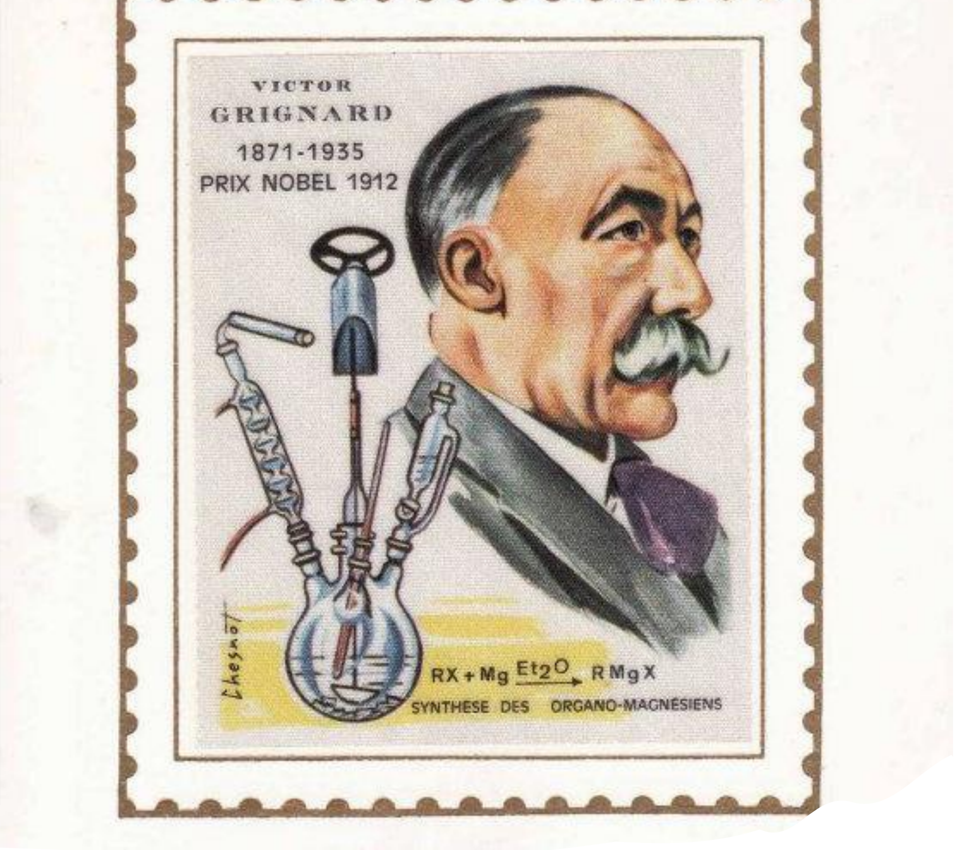



F

*1950*

*Alder*

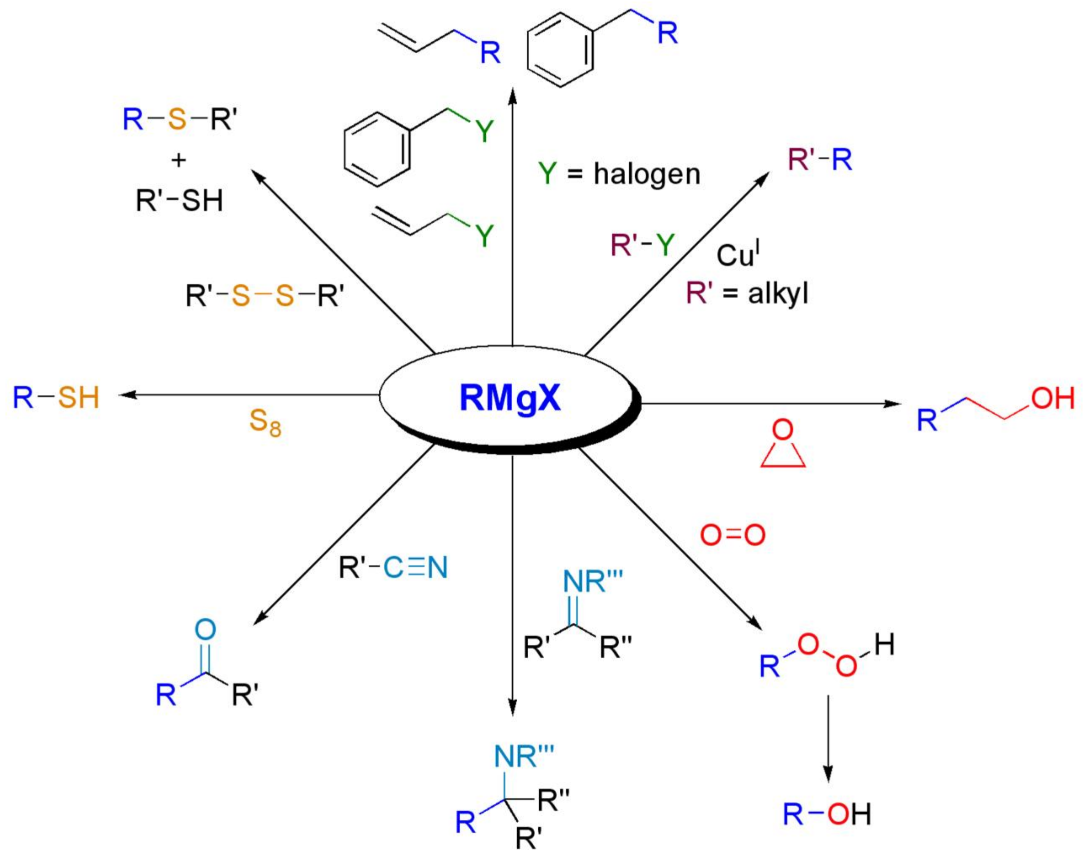


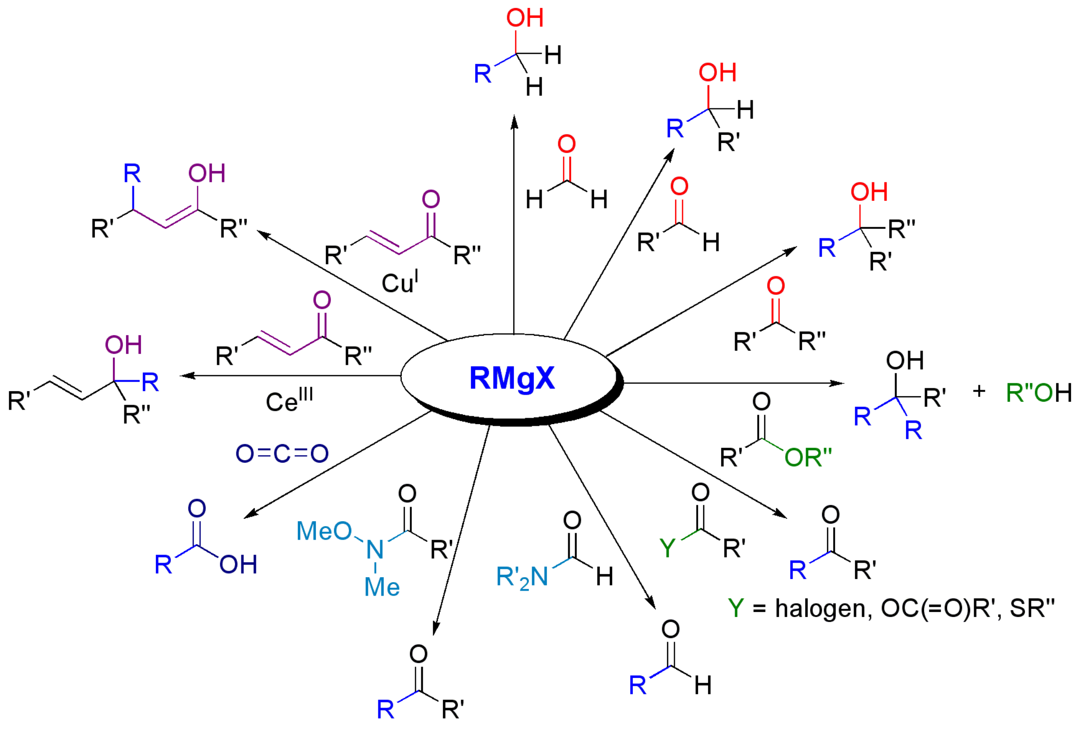





# Lab 6
# Grignard Reaction

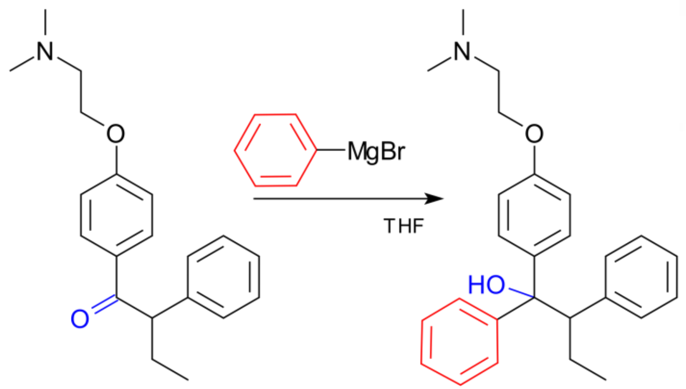
# Grignard reactions



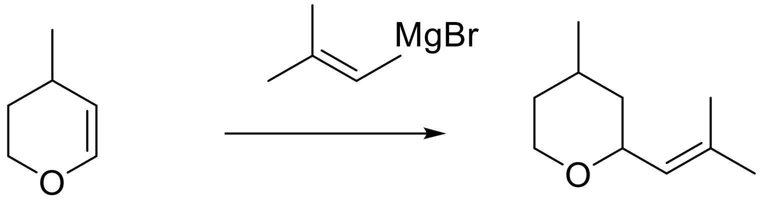
# Some applications

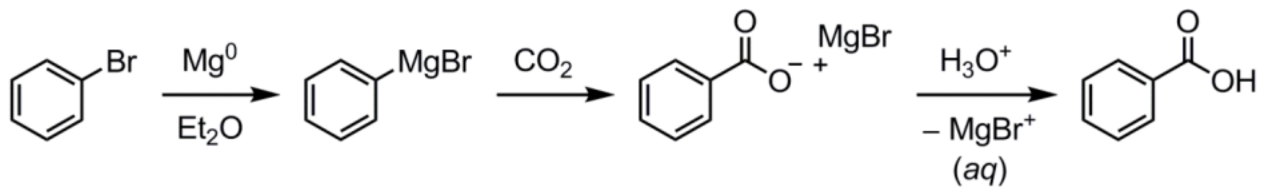
## Breast cancer treatment

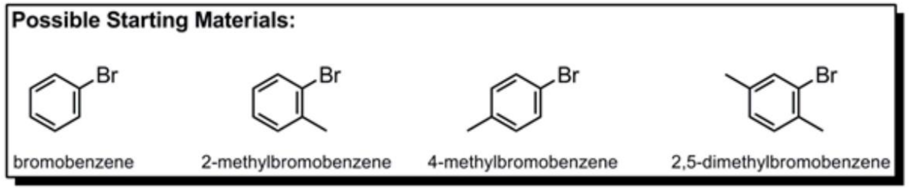


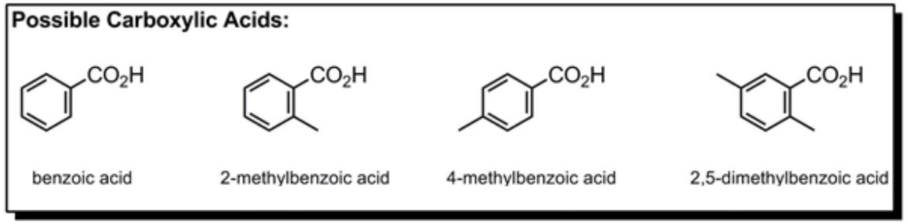



## Synthesis of rose oxide



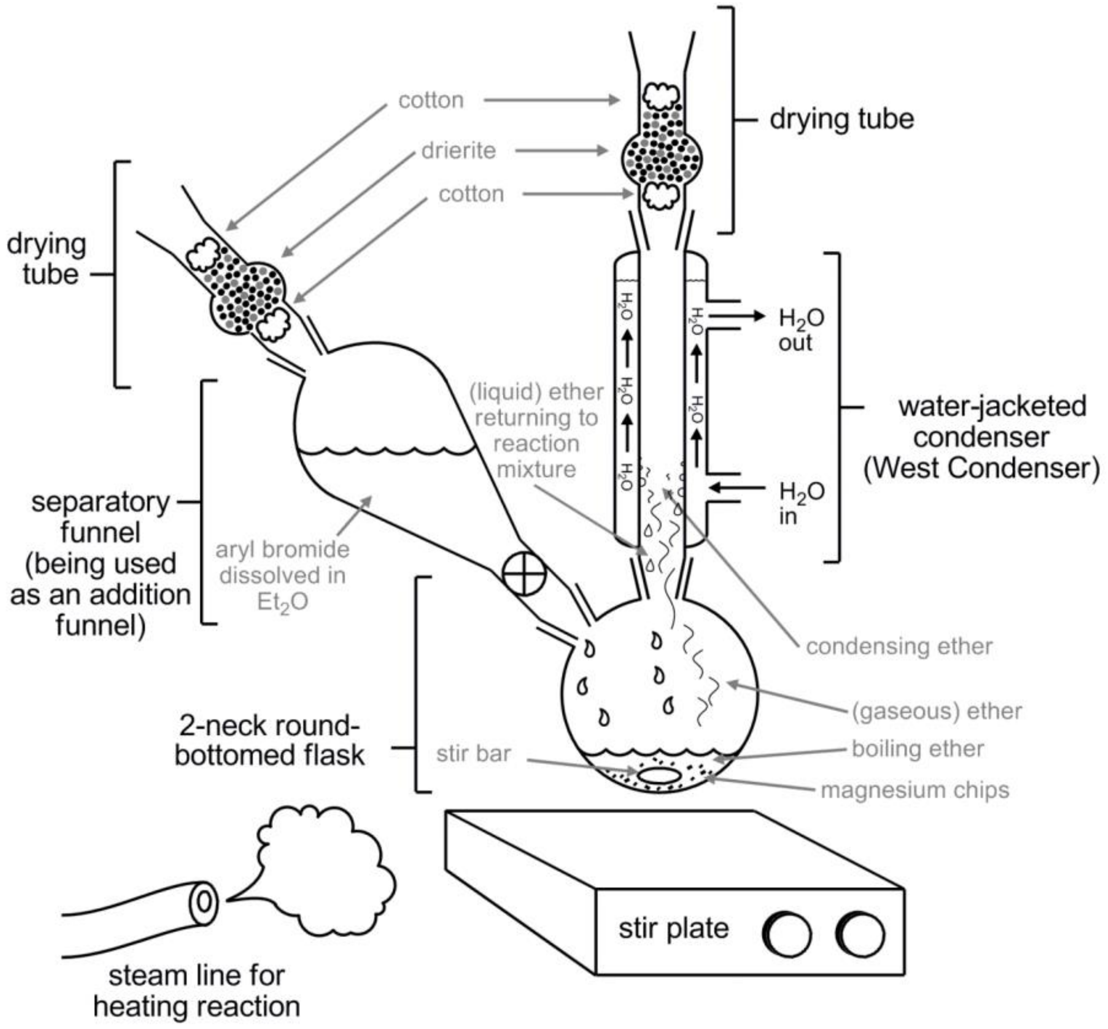




| Chemical | Appearance | MW | Equivalent | Amount | Notes |
|---|---|---|---|---|---|
| Starting materials | Clear liquid | | 1 | 0.025 moles | Flammable liquids, Aquatic Hazard |
| Possible products | ? | | 1 | | Damage lung |
| Mg | Solid | | 1 | 0.7 g | Flammable solid |
| Diethyl Ether | Lq | | Solv | | Extremely flammable |
| dry ice | | | Excess | | Cause frostbite |
| HCl | | | / | | Corrosive |
| NaOH | | | / | | Corrosive |

# Glassware Setup and Excluding Water



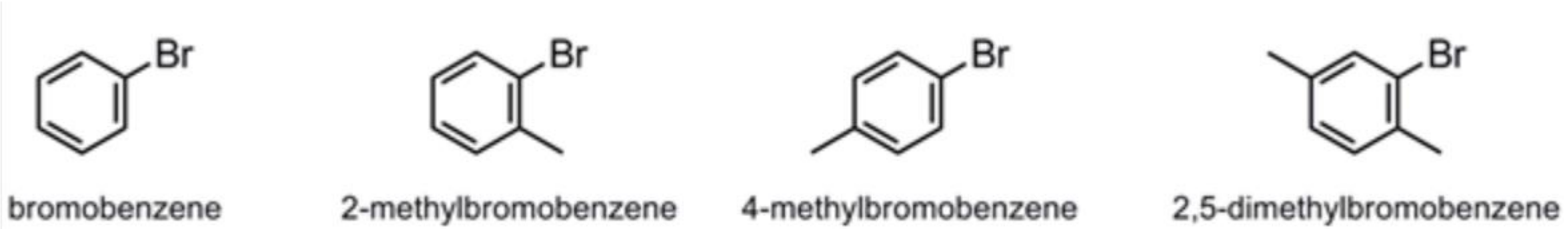

$$RMgX \xrightarrow{H_2O} RH + Mg(X)(OH)$$

- Dry glassware before reaction – flame dry with Bunsen burner
- Keep system dry during Grignard formation – drying tubes
- System is sensitive until Grignard reagents react with $CO_2$

# Procedural Guidance

- Diethyl ether is extremely flammable
- Slow addition of reagent allows for a controlled reaction
  - Why might this be important? (two reasons)
- Dry ice can quickly condense water vapor onto its surface thus we must act quickly
  - What might go wrong if we take our time?

- Unknowns:



# Purification

- Purification methods we have seen include: column chromatography, recrystallization, extractions, distillations.

- What are we trying to isolate?  What are we trying to remove?

- Which purification methods apply to the Grignard system?
- What are the benefits and drawbacks to those methods?

# $^1$H-NMR and Carboxylic Acids

Why is $H_a$ broad in the spectra on the left?

Why doesn't $H_a$ show up in both spectra?