# Functional group reactions studied in CHEM 261

#### Alcohols

1. Reaction with SOCl<sub>2</sub>, PX<sub>3</sub> or HX

2. Dehydration

$$\begin{array}{c|c} & H \\ \hline & H_2SO_4 \text{ or } H_3PO_4 \\ \hline & \Delta \end{array}$$

#### **Alkanes**

1. Halogenation

RH 
$$\frac{X_2/\Delta \text{ or hv}}{}$$
 RX

#### **Alkenes**

1. Hydrogenation

$$\begin{array}{c|c}
 & H_2/\text{Pt, Pd or Ni} \\
\hline
 & \text{solvent, pressure}
\end{array}$$

2. Addition of HX

3. Oxymercuration

# 4. Hydroboration

## 5. Addition des halogènes

$$\begin{array}{c|c} & & & \\ \hline & & & \\ \hline \end{array}$$

#### 6. Addition of X<sub>2</sub>/H<sub>2</sub>O

#### 7. Addition of carbenes

$$\begin{array}{c|c} & CH_2N_2/\Delta \text{ or hv} \\ \hline \\ & X \\ \hline \\ & RO^-, CHX_3 \\ \hline \end{array}$$

## 8. Ozonolysis

# Alkyl halides

### 1. Reduction

2. Corey - Posner, Whitesides - House synthesis

RX 
$$\frac{1. \text{Li}}{2. \text{Cul}}$$
  $R_2\text{CuLi}$ 

$$R_2CuLi$$
  $\xrightarrow{R'X (1^\circ) \text{ or } ArX}$  R-R or R-Ar

3. Finkelstein reaction

4. Williamson synthesis

5. Dehydrohalogenation

# Alkynes

1. Alkylation of terminal alkynes

$$R \xrightarrow{\qquad \qquad } H \xrightarrow{1. \text{ NaNH}_2} R \xrightarrow{\qquad \qquad } R'$$

2. Catalytic hydrogenation

$$\frac{}{} = \frac{H_2/Pt, Pd \text{ or Ni}}{\text{solvent, pressure}}$$

3. Addition of halogens

$$\times$$
  $\times$   $\times$   $\times$   $\times$   $\times$   $\times$   $\times$ 

4. Addition of HX

$$H \longrightarrow HX \longrightarrow H \longrightarrow X$$

# 5. Formation of oxacyclopropanes