Roadmap for Reactions from Chapters 6–11

Carbon-carbon bond forming reactions are indicated by reagents written with solid backgrounds. Reactions that cleave carbon-carbon bonds are indicated by reagents that are circled.

Legend on the next page.
(A) Regiochemistry: Markovnikov addition to a $\pi$ bond
(B) Stereochemistry: anti-addition
(C) Regiochemistry: non-Markovnikov addition to a $\pi$ bond
(D) Stereochemistry: syn-addition
(E) Works well for methyl and 1° haloalkanes
(F) Stereochemistry: gives $cis$-alkenes as products
(G) Stereochemistry: gives $trans$-alkenes as products
(H) Reactivity of C-H bonds follows 3° > 2° > 1°
(I) Works for methyl, 1°, and 2° haloalkanes
(J) Works for 2° and 3° haloalkanes, may see rearrangements
(K) Works for all haloalkanes except methyl, although a bulky (non-nucleophilic) base must be used for 1° haloalkanes. Regiochemistry: follows Zaitzev's rule so the more substituted alkene predominates. Stereochemistry: requirement for the X and H to be eliminated with anti-periplanar geometry.
(L) PbBr$_3$ and SOX$_2$ works for methyl, 1°, and 2° Haloalkanes. HX can give rearrangements.
(M) For 1° alcohols.
(N) For 2° alcohols.
(O) Regiochemistry: the product with the more substituted alkene predominates.
Carbon-carbon bond forming reactions are indicated by reagents written in solid backgrounds with white lettering.
Roadmap for Reactions from Chapter 19

Carbon-carbon bond forming reactions are indicated by reagents written with solid backgrounds and white lettering.

- **β-Alkylated carbonyls**
- **β-Hydroxy carbonyls**
- **β-Unsaturated carbonyls**
- **Hydroxy carbonyls**
- **Ketoesters**
- **Dicarbonyls**
- **Carboxylic acids**
- **Aldehydes**
- **Ketones**

### Enamine Reactions

1. **LDA**
2. **R-X**
3. **H₂O⁺/H₂O**

### Michael Reaction

1. **R₂CuLi**
2. **H₂O⁺/H₂O**

### Various enolates or amines

1. **NaOEt**
2. **HOEt**
3. **H₂O⁺/H₂O**

### Dieckmann Condensation

1. **NaOEt**
2. **HOEt**
3. **H₂O⁺/H₂O**

### Claisen Condensation

1. **NaOEt**
2. **HOEt**
3. **H₂O⁺/H₂O**

### Acetoacetic Ester Synthesis

1. **NaOEt/HOEt**
2. **R-X**
3. **NaOH, H₂O**
4. **H₂O⁺/H₂O**
5. **Δ**

### Malonic Ester Synthesis

1. **NaOEt/HOEt**
2. **R-X**
3. **NaOH, H₂O**
4. **H₂O⁺/H₂O**
5. **Δ**