Hey guys! We have officially made it to the last resource! Now time to knock that Organic Chemistry II final out of the park! Also, be sure to check out previous resources if you need extra review for a specific topic. As always, if you have any questions or need study tips, please do not hesitate to reach out to me at Megan_Hudson2@baylor.edu!

If you need extra help or review, feel free to drop into the Tutoring Center or make an appointment online! To reserve an appointment slot, go to https://baylor.edu/tutoring.

**Key Words:** Final Review

**HIGHLIGHT #1: Amines**

- Amines are derivatives of Ammonia; the corresponding number of R groups determines the type of amine
  - Primary
  - Secondary
  - Tertiary

Reactions
- Alkylation of Ammonia

Note: Can be repeated with multiple CH₃I to eventually produce a quaternary ammonium salt

- Azide Synthesis
- Gabriel Synthesis
- Reductive Amination
- Acylation of Amines
- Hofmann Elimination
- Secondary Amines and Nitrous Acid to form N-Nitrosamines
- Diazotization
- Sandmeyer Reactions

- Schiemann Reaction (Fluorination)

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**HIGHLIGHT #2: Nomenclature Review**

**Common Functional Groups Nomenclature:**

(Lower priority substituent) **Prefix - Parent Chain - Suffix** (Highest priority principal group)

<table>
<thead>
<tr>
<th>Functional Group</th>
<th>Prefix</th>
<th>Suffix</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboxylic Acid</td>
<td>Carboxy-</td>
<td>-oic acid</td>
<td>Pentanoic Acid</td>
</tr>
<tr>
<td>Acid Anhydride</td>
<td>Alkoxycarbonyl-</td>
<td>-oate</td>
<td>Acetic Benzoic Anhydride</td>
</tr>
<tr>
<td>Ester</td>
<td>Halocarbonyl-</td>
<td>-oate</td>
<td>Methyl Propanoate</td>
</tr>
<tr>
<td>Acid Halide</td>
<td>Halocarbonyl-</td>
<td>-oyl halide</td>
<td>Propanoyl chloride</td>
</tr>
<tr>
<td>Amide</td>
<td>Carbamoyl-</td>
<td>-amide</td>
<td>N-propylethanamide</td>
</tr>
<tr>
<td>Functional Group</td>
<td>Prefix</td>
<td>Suffix</td>
<td>Example</td>
</tr>
<tr>
<td>------------------</td>
<td>--------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>Nitrile</td>
<td>Cyano-</td>
<td>-nitrile</td>
<td>Butanenitrile</td>
</tr>
<tr>
<td>Aldehyde</td>
<td>Formyl-</td>
<td>-al or -carbaldehyde (if proximally attached to ring)</td>
<td>4-bromo-pentanal</td>
</tr>
<tr>
<td>Ketone</td>
<td>Oxo-</td>
<td>-one</td>
<td>2-hexanone</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Hydroxy-</td>
<td>-ol</td>
<td>3-methyl-2-butanol</td>
</tr>
<tr>
<td>Thiol</td>
<td>Mercapo-</td>
<td>-thiol</td>
<td>2-ethoxyethane-1-thiol</td>
</tr>
<tr>
<td>Amine</td>
<td>Amino-</td>
<td>-amine</td>
<td>N,N-dimethylpentylamine</td>
</tr>
<tr>
<td>Alkene</td>
<td>Enyl-</td>
<td>-ene</td>
<td>2-pentene</td>
</tr>
<tr>
<td>Alkyne</td>
<td>Ynyl-</td>
<td>-yne</td>
<td>1-hexyne</td>
</tr>
<tr>
<td>Alkyl</td>
<td>Yl-</td>
<td>-ane</td>
<td>2-dimethylbutane</td>
</tr>
</tbody>
</table>

**Functional Groups that can only be Prefixes (No Suffix):**

<table>
<thead>
<tr>
<th>Halides</th>
<th>Prefix</th>
<th>Suffix</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-X</td>
<td>depends on halide</td>
<td>-</td>
<td>1-iodopropane</td>
</tr>
</tbody>
</table>

| Ethers  | Alkoxy- | -       | 1-methoxypropane |
Nitro pentane

Check out these nomenclature review videos!
- https://www.youtube.com/watch?v=HhT2E7wuAgg
- https://www.youtube.com/watch?v=m9jM8lWxrAE

**HIGHLIGHT #3: Electrophilic Aromatic Substitution**
- Mechanism Flow

[Diagram showing mechanism flow]

- Common Reactions

[Diagram showing common reactions]

**HIGHLIGHT #4: Nucleophilic Addition Reactions and other Reactions with Carbonyls**
- Mechanism Flow (Nucleophilic Attack and Proton Transfer steps are interchangeable depending on if reaction is in acidic or basic conditions; Green is basic conditions and Orange is acidic conditions)
• Common Reactions (Notice that most of the reagents have a \([H^+]\) which means they will follow the orange mechanism flow above)

### HIGHLIGHT #5: Wittig Reaction

1. Formation for Wittig Reagent

   ![Wittig Reagent Reaction](image)

2. Formation of Alkene and Triphenylphosphine oxide

   ![Alkene and Triphenylphosphine oxide Formation](image)
HIGHLIGHT #6: Reactions involving Alpha Carbons

- Enols and Enolates

- Aldol and Claisen Reactions

- Michael Reaction

1. Grignards favor 1,2-addition
2. Gilmans favor 1,4-addition

- Stork Enamine Synthesis
  1. Formation of Enamine
  2. Michael Addition
  3. Hydrolysis

**THINGS YOU MAY STRUGGLE WITH:**
1. REVIEW THESE MECHANISMS! It will be difficult to recall what different reactions do with different reagents so I highly recommend reviewing the starburst diagrams in your textbook so you are comfortable with them come test day. You should be able to look for patterns in the mechanisms (H$_3$O$^+$ donates protons, leaving groups leave, bases abstract protons, etc.) to help you remember the mechanism.

2. Be comfortable with synthesis and retrosynthesis! It’s a tough topic to tackle but it is a big part of Organic Chemistry II and will DEFINITELY be on your final. I highly recommend reviewing the synthesis strategies for each chapter and do as many practice problems as you can within each chapter!

**PRACTICE PROBLEMS:**

1) Propose an efficient synthesis

2) Provide a name for the following compound
3) Predict the major product

\[ \text{[Chemical structure image]} \]

4) Draw out the mechanism for the 2 steps involved in a Wittig Reaction

\[ \text{[Chemical structure image]} \]

**ANSWERS TO PRACTICE PROBLEMS:**

1)

\[ \text{[Chemical structure image]} \]

2) 

\[ \text{[Chemical structure image]} \]

2 phenyls attached to N, so this molecule is **N,N-diphenyl propionamide**