

Focus on these items for test 2. Review and understand everything on this list. Practice drawing the reacting atoms with **all** bonds, charges, and curved arrows. This will help you understand how the reactions actually happen. Practically every reaction step that you really understand will include a curved arrow going from Nu:⁻ to E⁺ (or from base:⁻ to acid⁺). Pay particular attention to the pictures in our class notes.

Names

- Be able to determine the names and structures of alcohols, ethers, aldehydes, and ketones.

Chapter 17 (Alcohols)

- Reaction steps to prepare alcohols by oxymercuration of alkenes using Hg(OAc)₂ followed by NaBH₄.
- Reaction steps to prepare alcohols by reduction of carbonyls with hydrides and Grignards. Didn't we see this nucleophilic addition again in Ch 19?
- Reaction steps for dehydration of alcohols (E1 with acid, E2 with POCl₃ and base).
- Reaction steps to convert alcohols to halides (SN1 with acid, SN2 with SOCl₂).

Ch 18 (Ethers)

- Williamson ether synthesis (base creates alkoxide, then S_N2 with 1^o halide RCH₂X).
- Reaction steps to prepare ethers by alkoxymercuration of alkenes with alcohols using Hg(OOCCF₃)₂ then NaBH₄. Is this similar to oxymercuration in Ch 17?
- Reaction steps to cleave ethers with acid. First protonation, then followed by X⁻¹ for S_N2 / S_N1, or followed by OOCCF₃ for E1.
- Reaction steps to prepare epoxide with a halohydrin and a base. This is an intramolecular Williamson synthesis.
- Reaction steps to open epoxide ring with acid. The reaction can be completely S_N2 or partially S_N1.

Ch19 (Aldehydes and Ketones)

- Reaction steps for nucleophilic addition of H₂O, HCN, Grignards, and hydrides. Add Nu to electrophilic carbonyl carbon, then protonate alkoxide.
- Reaction steps to prepare imines with NH₂R and enamines with NHR₂. Add Nu to carbonyl carbon, then remove H₂O, then deprotonate either N or alpha C.
- Reaction steps for nucleophilic addition to "beta" carbon of conjugated enone. Why is this slightly different from nucleophilic addition? What stabilizes the anion?