Nominalture
- alcohols, alkoxides, alkenes, aldehydes, ketones, benzene

Leaving Groups \( \leftarrow \) Alcohols
- tosyl chloride, \( \text{SOCl}_2 \); \( \text{PBr}_3 \)

Alcohols
Hydration + Dehydration
Oxidation: \( \text{PCC} \) vs. \( \text{CrO}_3/\text{H}_2\text{O} \)
alkoxides \( \text{NaOH}, \text{Na} \) → Williamson Ethyl Synthesis

Aldehydes + Ketones
ROAD-Hydrates, acetals, ketals, imines, enamines, cyanohydrins
reactivity of aldehydes vs. ketones
reduction: \( \text{LiAlH}_4 \) vs. \( \text{NaBH}_4 \)
alkylation: \( \text{Grignard}, \text{Wittig} \)
Wolff-Kishner reduction (Hydrazones)

Epoxides
\[ \text{mCPBA} \rightarrow \text{cyclic vs. acyclic opening} \]

Protecting Groups
- DHP; TBDMSCl

Conjugation
- NO kinetic vs. thermodynamic
- MO description of allyl bonding, non-bonding, anti-bonding
- Cumulated dienes

Aromaticity
- Aromatic, non-aromatic, anti-aromatic
- MO of cyclobutadiene, benzene
- examples:
Synthesis: nitration, sulphonation, alkylation, acylation, halogenation.

O,p vs meta; activator vs deactivators.

Pericyclic

Homo-/Lumo theory

ground vs excited states

crotoatory / disrotatory

Diels-Alder - S-cis/S-trans; Secondary

orbital effects endo/exo

\[
\begin{align*}
\text{OH} & \\
\text{Cr} & \\
\rightarrow & \\
\text{H} & \\
\end{align*}
\]

longer \rightarrow main chain

ethoxy \rightarrow oxy

1-ethoxybutane
End of Chem 12B.