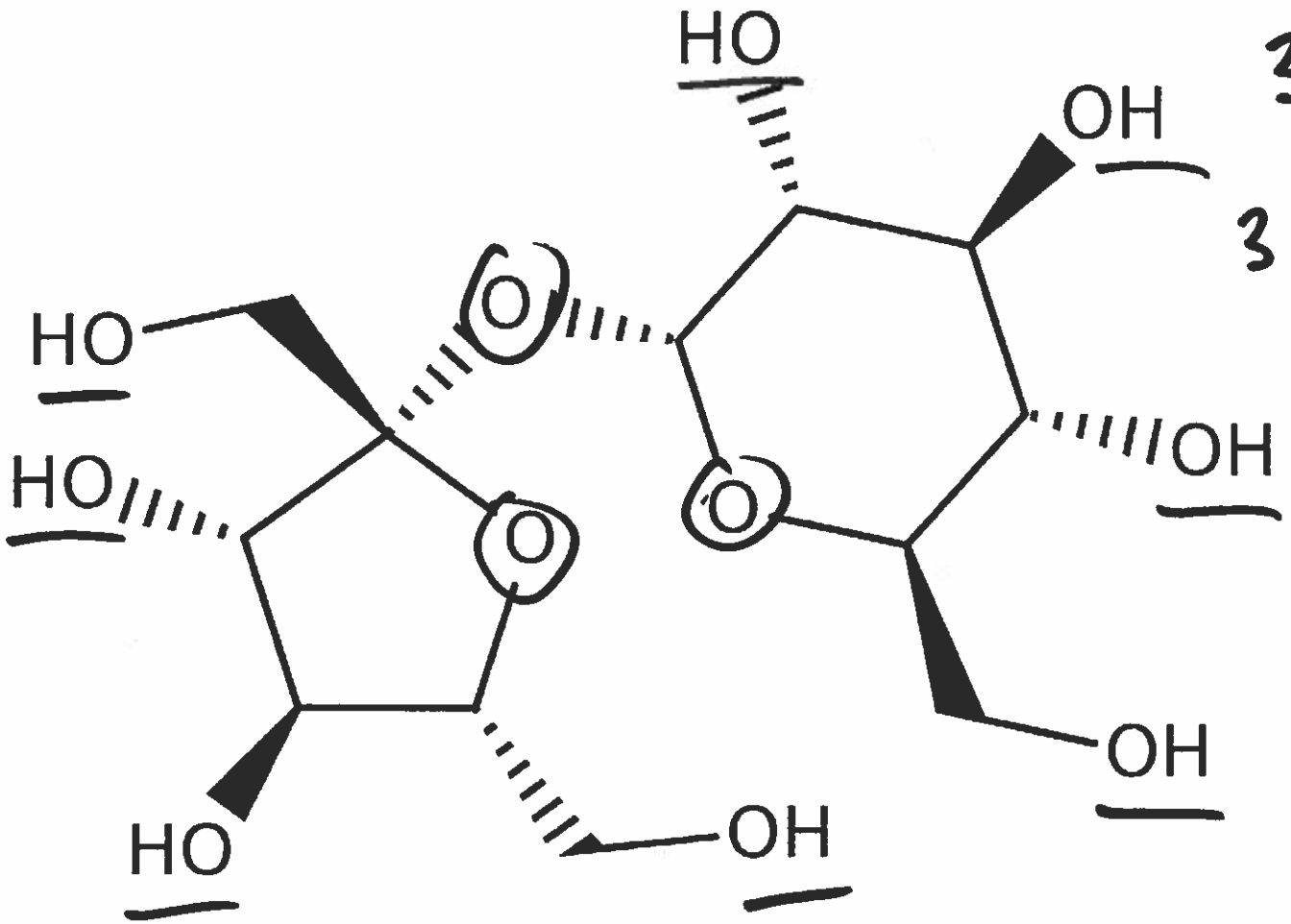
Comments on midterm 1

- Chapters 7 and 8*
  - *some of the material overlaps with Chapter 9.6 (synthesis of alcohols and ethers) and you may find relevant problems in the midterm
- Excludes double elimination (Chapter 8.10)
- What should (must?) you do first when preparing for midterm 1?
  - focus on everything S_N1, S_N2, E1, E2 (including synthesis)!!!

Sucrose (sugar)



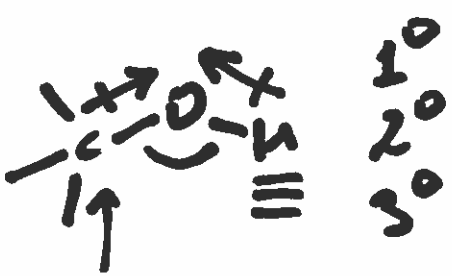
5×2^{0}

3×1^{0}

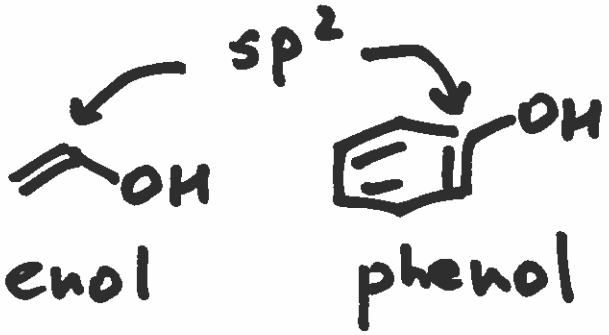
3 x ethers

Alcohols, ethers, epoxides

Alcohols, enols, phenols



sp3 hybridized

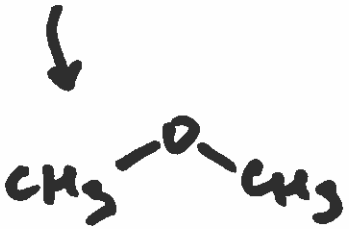


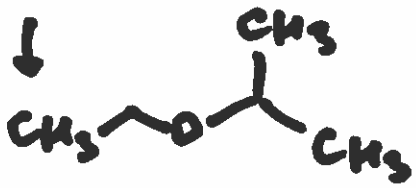
enol phenol

H-bonding!

bond angle 109°

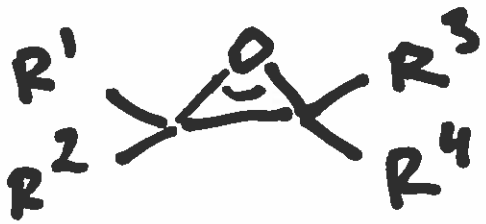
Dialkyl ethers, symmetrical and unsymmetrical





bond angle 111°

Epoxides

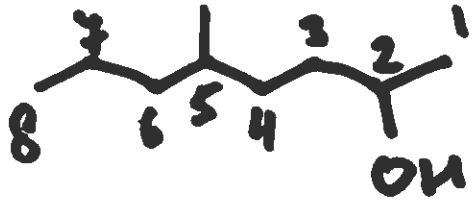


special case of cyclic ethers

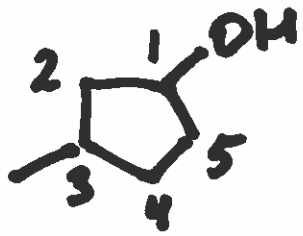
bond angle 60° → strain (angle strain)

Alcohols: nomenclature

IUPAC, common names, cyclic alcohols, diols, triols

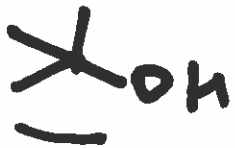


- octane (8c)
- octan-2-ol
- 5-methyl octan-2-ol

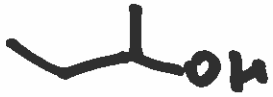


- 3-methylcyclopentanol

↑ no numbering for cyclic compounds



tert-butyl alcohol



sec-butyl alcohol

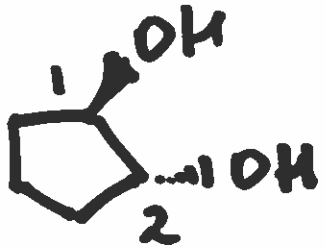
Alcohols: nomenclature

IUPAC, common names, cyclic alcohols, diols, ~~triols~~

diols or glycols → 2 × OH groups

ethane-1,2-diol

ethylene glycol



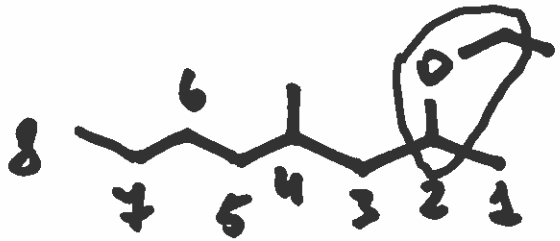
trans-cyclopentane-1,2-diol

Ethers: nomenclature

Simple ethers (dialkyl, alkyl alkyl), complex ethers, cyclic ethers

→ CH_3-O-CH_3 dimethyl ether

→  ethyl isopropyl ether

 ← ethoxy group

- [redacted] 2-ethoxy-4-methyloctane

tetrahydrofuran

tetrahydropyran

Epoxides: nomenclature

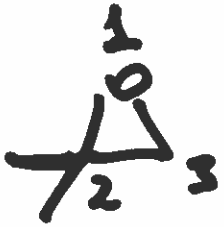
Epoxyalkanes, oxiranes, alkene oxides

1,2-epoxycyclohexane

cis-3,4-epoxy hexane

- alkyl chain → hexane

oxirane

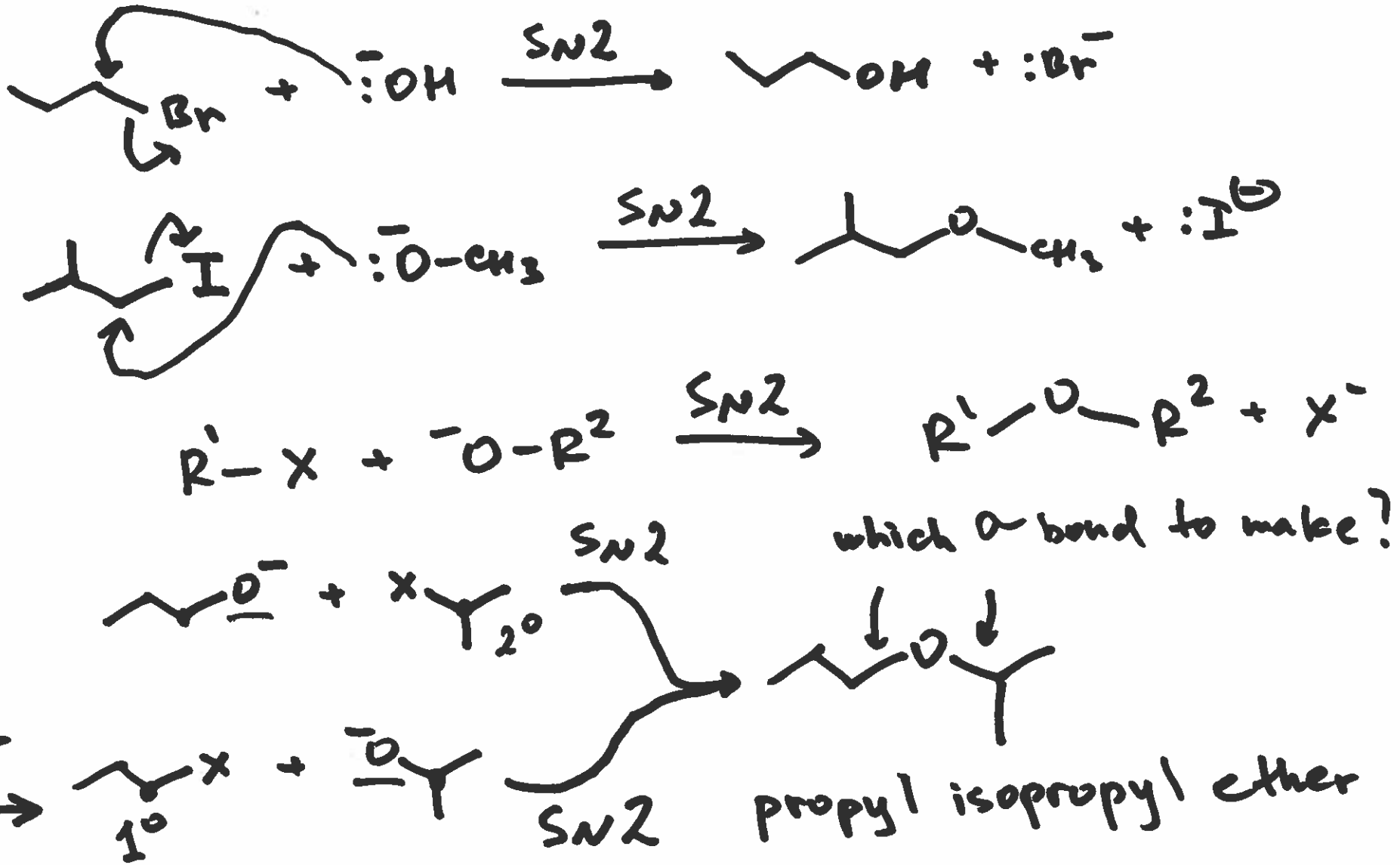


- 2,2-dimethyl oxirane

ethylene → ethylene oxide

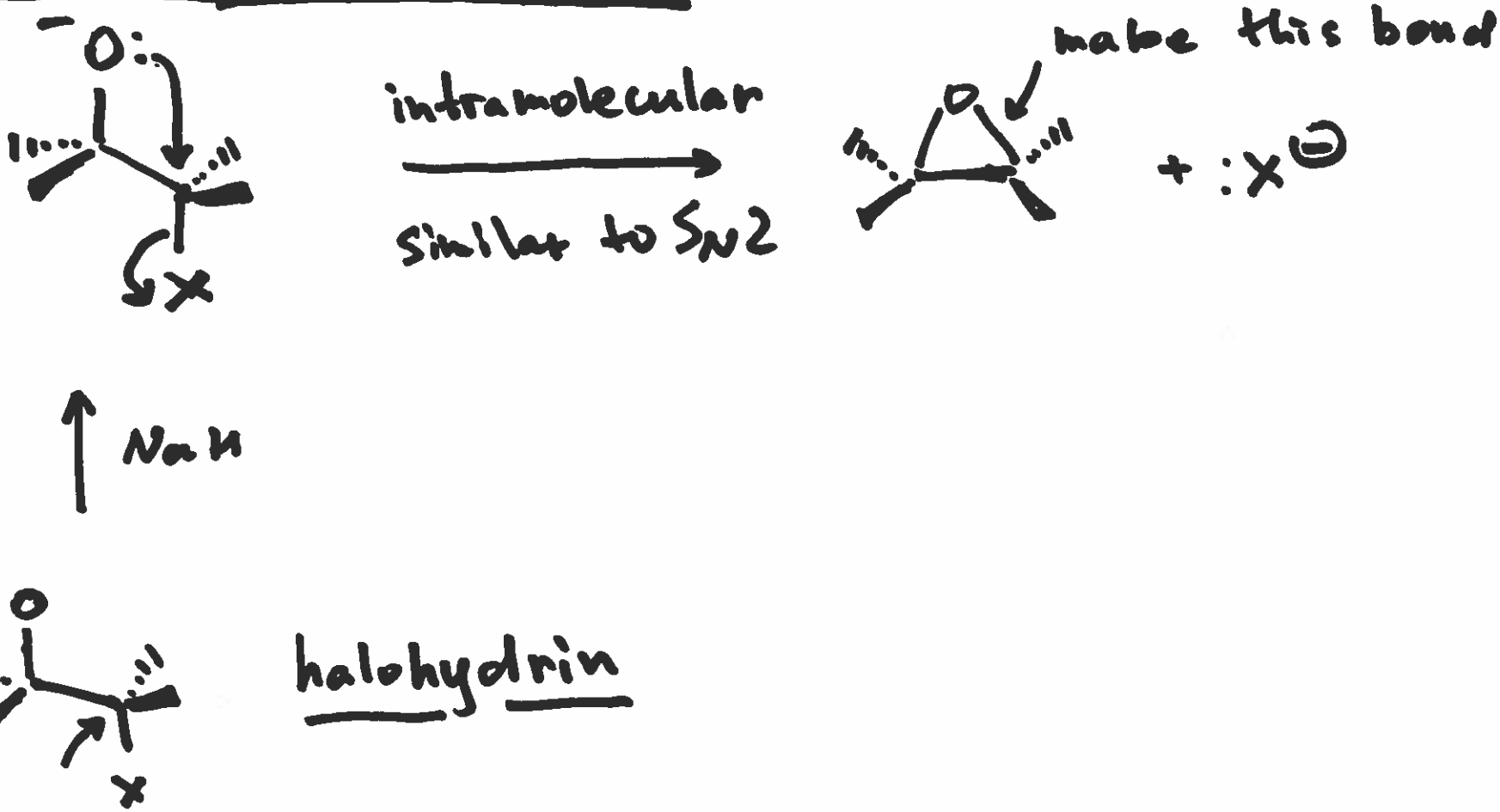
Alcohols, ethers, epoxides: synthesis

S_N2 reactions, Williamson ether synthesis



Alcohols, ethers, epoxides: synthesis

Intramolecular nucleophilic substitution reactions and synthesis of epoxides



Alcohols, ethers, epoxides: reactions

Converting hydroxy group into a good leaving group and reactions of alcohols